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November 1, 1977 Volume 964 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Availability of 1977 Edition of Title 37 Code of Federal Regulations

The July 1977 edition of Title 37 Code of Federal Regulations, entitled "Patents, Trademarks, and Copyrights," is now for sale by the Superintendent of Documents for $3.00 per copy. The format of this booklet has been structured to allow parts pertaining to patent regulations and trademark regulations to be grouped separately. This booklet is published by the Office of the Federal Register and contains all patent rules and forms, trademark rules and forms as well as the copyright rules. The stock number is 022–003–93389–1.

Orders for this booklet should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

RENE D. TEGTMEYER,
Oct. 11, 1977. *Assistant Commissioner for Patents.*

Board of Appeals Decisions Rendered in the Month of September 1977

Affirmed	208
Affirmed in Part	21
Reversed	67
Total	296

Set IV of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders 582 to 593 issued between April 1, 1977 and June 30, 1977. All of these addenda have been consolidated into Set IV of "Addenda to the Classification Definitions."

Class	*Class*	*Class*	*Class*	*Class*
2	72	156	245	324
3	73	164	249	328
5	74	169	250	329
6	75	173	252	330
8	76	174	254	331
13	83	175	256	332
15	84	176	260	333
19	85	178	264	335
24	87	179	266	336
26	93	180	267	337
28	100	188	273	338
29	101	191	277	340
30	102	192	280	343
32	106	200	283	350
34	109	204	285	357
38	112	206	289	360
43	113	210	291	361
44	114	214	292	363
51	118	215	295	364
52	122	219	301	365
53	123	220	302	403
55	125	221	307	416
57	126	222	308	417
59	128	223	310	418
61	132	226	312	423
62	136	228	313	425
63	137	235	314	427
64	138	238	315	428
65	139	239	318	429
66	140	241	320	444
68	141	242	321	
69	148	243	322	
70	149	244	323	

ALFRED C. MARMOR,
Oct. 6, 1977. *Administrator for Documentation.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,938,676, G. H. Magrath, TOP DRIVE SPINNING SPINDLE, **filed** June 10, 1977, United States Court of Claims (District of Columbia), Doc. 13–77, *George H. Magrath* v. *The United States.* Order, the motion to dismiss is granted and the petition is dismissed, July 8, 1977.

3,275,487, J. H. Lemelson, METHOD AND AUTOMATIC APPARATUS FOR PRODUCING PILE SURFACED PLASTIC SHEETING; **3,414,928,** same, COMBINATION SPONGE AND SCOURER, **filed** July 7, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c2442, *Jerome H. Lemelson* v. *Minnesota Mining and Manufacturing Company.*

3,315,278, Schatzki, Schleeweiss and Richardson, SWIMMING POOL STRUCTURE, **filed** July 6, 1977, D.C., E.D.N.Y., (Brooklyn), Doc. 77–C–1382, *Swim 'n Play, Inc.* v. *Polytech Pool Manufacturing, Inc.*

3,414,928. (See 3,275,487.)

3,515,792, R. Deutsch, DIGITAL ORGAN; **3,610,799,** G. A. Watson, MULTIPLEXING SYSTEM FOR SELECTION OF NOTES AND VOICES IN AN ELECTRONIC MUSICAL INSTRUMENT; **3,610,805,** Watson and Deutsch, ATTACK AND DECAY SYSTEM FOR A DIGITAL ELECTRONIC ORGAN; **3,610,806,** R. Deutsch, ADAPTIVE SUSTAIN SYSTEM FOR DIGITAL ELECTRONIC ORGAN; **3,639,913,** G. A. Watson, METHOD AND APPARATUS FOR ADDRESSING A MEMORY AT SELECTIVELY CONTROLLED RATES; **3,743,755,** same, **filed** June 2, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–2002–FW, *Nippon Gakki Seizo Kabushiki Kaisha* v. *Allen Organ Company.*

3,544,267, G. R. Dychdala, CALCIUM HYPOCHLORITE PRODUCT AND PROCESS FOR PRODUCING SAME, **filed** June 29, 1977, D.C., N.D. Ohio (Akron), Doc. C77–240–A, *Pennwalt Corporation* v. *PPG Industries, Inc.*

3,610,799. (See 3,515,792.)

3,610,805. (See 3,515,792.)

3,610,806. (See 3,515,792.)

3,639,913. (See 3,515,792.)

3,743,755. (See 3,515,792.)

3,751,649, T. W. Hart, Jr., MEMORY SYSTEM EXERCISER, **filed** Mar. 16, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV74–2016–DWW, *Macrodata Corporation* v. *Xincom Corp. and Tektroniz, Inc.* It is hereby stipulated that the complaint and counterclaim be dismissed, Jan. 12, 1976.

3,785,050, Witledge and Kavick, COUPLING ATTACHMENT DEVICE; **3,858,298,** same, SWAGING APPARATUS, **filed** Apr. 14, 1977, D.C., N.D. Ga. (Atlanta), Doc. C77–584A, *Parker-Hannifin Corporation* v. *Samuel Moore & Company.*

3,792,133, R. R. Goughnour, METHOD FOR SLIP-FORMING WALLS OF ASYMMETRICAL TRANSVERSE CROSS SECTION; **3,957,405,** same, SLIP FORM HAVING HINGED GATE MEANS; **4,014,633,** same, ADJUSTABLE SLIP FORM, **filed** June 6, 1977, D.C., N.D. Iowa (Sioux City), Doc. C–77–4038, *Gomaco Corporation* v. *A. C. Aukerman Co.*

3,809,264, G. K. Mayers, METHOD OF LOADING CARGO CONTAINERS, **filed** Apr. 4, 1977, D.C. Oreg. (Portland), Doc. 77–279, *Gerald Mayers et al* v. *Port of Portland et al.*

3,810,631, J. M. Braly, GOLF CLUB HEAD OF THE IRON TYPE HAVING A CONCAVE SOLE, **filed** Nov. 12, 1976, D.C. Del. (Wilmington), Doc. 76–395, *Con-Sole Golf Corporation* v. *Wilson Sporting Goods Company.* The above case is dismissed with prejudice, Apr. 11, 1977.

3,823,522, Jureit and Jardins,, HINGED CONNECTOR PLATE, **filed** June 7, 1977, D.C., M.D. Pa. (Scranton), Doc. 77–485. *Automated Building Components, Inc.* v. *Thomas Fahringer, doing business as Fahringer Distributors.* **Same, filed** June 29, 1977, D.C., S.D. Fla. (Miami), Doc. 77–6291–C–JLK, *Alpine Engineering Products, Inc. et al* v. *Automated Building Components, Inc.*

3,858,298. (See 3,785,050.)

3,858,623, L. R. Lefkowitz, PAPERMAKERS FABRICS, **filed** Dec. 23, 1976, D.C., W.D. La. (Shreveport), Doc. 76–1359, *Huyck Corporation* v. *Scapa Group, Limited and Unaform, Inc.* **Same, filed** Dec. 23, 1976, D.C. S.C. (Greenville), Doc. 76–2456, *Huyck Corporation* v. *Asten-Hill Mfg. Co. and Wisconsin Wire, Inc.* **Same, filed** Feb. 17, 1977, D.C.S.C. (Greenville), Doc. C.A. 77–326, *Unaform Inc.* v. *Huyck Corporation.* **Same, filed** July 1, 1975, D.C., M.D. Ala. (Montgomery), Doc. 75–225–N, *Huyck Corporation* v. *Albany International Corporation.* Judgment, defendant is hereby restrained and enjoined from directly or indirectly infringing any claim of said patent. Judgment is hereby entered against defendant, Feb. 3, 1977.

3,868,883, J. M. Tucker, GUIDANCE SYSTEM, **filed** May 20, 1977, United States Court of Claims (District of Columbia), Doc. 278–77, *McDonnell Douglas Corporation* v. *The United States of America.*

3,895,380, Nishina and Suzuki, DIGIT DISPLAY APPARATUS, **filed** Apr. 26, 1977, D.C., S.D. Fla. (Miami), Doc. 77–1399–C–JLK, *Tamura Electric Works, Ltd.* v. *Kendale Technology Corporation.*

3,905,898, Johansen, Phillipp and Green, COMPOSITE REINFORCED HOSE WHEREIN THE REINFORCING MATERIAL IS BRAIDED AROMATIC POLYAMIDE FILAMENTS, **filed** Oct. 20, 1975, D.C., W.D. Okla. (Oklahoma City), Doc. 75–0889–C, *Samuel Moore and Company* v. *American Hose & Reel Co., Inc.* Complaint dismissed on motion of plaintiff, Oct. 20, 1975.

3,911,524, C. Parise, STEAM CLEANER DUMP BUCKET, **filed** Oct. 14, 1975, D.C. Colo. (Denver), Doc. 75–1073, *Parise & Sons, Inc.* v. *Magi-Clean, Inc.* Upon stipulation of counsel, order of dismissal without prejudice entered Dec. 15, 1976.

3,917,890, S. Levy, COMPOSITE TAPE AND METHOD OF FORMING THE SAME, **filed** Sept. 20, 1976, D.C., S.D. Tex. (Houston), Doc. CA76–H–1540, *The Leal Corp.* v. *Cooper Industries, Inc.*

3,929,020, R. W. Honkanen, LEAK-RESISTENT GAUGE, **filed** July 19, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76–2294–LEW, *Reino Honkanen* v. *Sportsways & Pittman Rubber Company.*

3,954,278, Shaper and Litcher, PHONOGRAPH PICKUP CARTRIDGE, **filed** July 5, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c2391, *Empire Scientific Corporation* v. *Shure Brothers, Inc.*

3,957,176, L. Marston, DISPOSABLE PUTTY DISPENSER, **filed** Nov. 4, 1976, D.C.N.J. (Trenton), Doc. 76–2117, *Dynatron/Bondo Corporation* v. *The Clausen Company.* Plaintiff voluntarily dismissed action, June 27, 1977.

3,957,405. (See 3,792,133.)

3,957,557, R. Fraige, WATER MATTRESS AND METHOD OF MANUFACTURE, **filed** Sept. 14, 1976, D.C., N.D. Calif. (San Francisco), Doc. C–76–1966–WAI, *Vinyl Products Mfg. Inc. and Richard Fraige* v. *Calco-Hawaiian Import & Export Co., doing business as Calco-Hawaiian, Inc., Paul D. Callenace and Ronald D. Beal.*

4,014,633. (See 3,792,133.)

D. 228,375, Wells and Krusinski, AUTOMOBILE FLOOR MAT, **filed** Nov. 19, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2941, *Pretty Products Incorporated* v. *American Biltrite Incorporated.* Case dismissed, June 30, 1975.

D. 227,498, McCanse and Gecan, ROTARY MOWER, **filed** Dec. 3, 1973, D.C. Kans. (Kansas City), Doc. KC–3869, *Hesston Corporation* v. *The Sun Master Corporation, Inc.* Defendant has infringed said design patent, June 17, 1976.

D. 236,535, Larsen and Oehring, VEHICLE LIGHT, **filed** Mar. 9, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV–77–861–F, *Bates Industries, Inc.* v. *K–D Lamp Co. et al.*

D. 239,301, R. Clarke, SEATED BENCH EXERCISING MACHINE; **D. 239,302,** same, TRICEP EXERCISING MACHINE; **D. 239,303,** same, VERTICAL BUTTERFLY EXERCISING MACHINE; **D. 239,306,** same, LEG CURL EXERCISING MACHINE; **D. 239,398,** same, ARM CURL EXERCISING MACHINE; **D. 239,399,** same, PULLOVER EXERCISING MACHINE; **D. 239,641,** same, LOWER BUTTOCKS AND HAMSTRING EXERCISING MACHINE; **D. 239,643,** same, HIP AND BUTTOCKS EXERCISING MACHINE, **filed** Dec. 1, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–3709–RMT, *Paramount Health Equipment Corp.* v. *United Physical Fitness Products et al.*

D. 239,302. (See D. 239,301.)

D. 239,303. (See D. 239,301.)

D. 239,306. (See D. 239,301.)

D. 239,398. (See D. 239,301.)

D. 239,399. (See D. 239,301.)

D. 239,641. (See D. 239,301.)

D. 239,643. (See D. 239,301.)

D. 240,903, M. L. Levin, ELECTRIC FOOD COOKER, **filed** Aug. 18, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76–2636–LEW, *Scovill Manufacturing Company* v. *Winnie Mae Manufacturing Co., Inc., doing business as American Electric.*

D. 244,647, G. Offredi, ARMCHAIR, **filed** June 29, 1977, D.C., S.D.N.Y., Doc. 77–C–3170, *Fratelli Saporiti Industria Arredamenti Di Saporiti, Sergio E. Giorgio S.N.S.C.* v. *Designers Furniture Center Int'l.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,516,149, Re. S.N. 822,973, Filed Sept. 19, 1977, Cl. 29/568, MACHINING APPARATUS WITH AUTOMATIC TOOL CHANGING MEANS, George Mickas, Owner of Record: *Ex-Cell-O Corporation, Detroit, Mich.,* Attorney or Agent: James H. Bower, Ex. Gp.: 342

3,579,311, Re. S.N. 828,972, Filed Aug. 29, 1977, Cl. 423/261, PROCESS AND APPARATUS FOR PRODUCING UO_2 POWDER, John J. McCoy, Owner of Record: *General Electric Co., New York, N.Y.,* Attorney or Agent: Ivor J. James, Jr., et al., Ex. Gp.: 223

3,756,212, Re. S.N. 822,691, Filed Aug. 8, 1977, Cl. 123/148 E, ARRANGEMENTS FOR ELECTRONICALLY DETERMINING AND ADJUSTING THE IGNITION TIME OF AN INTERNAL COMBUSTION ENGINE, Gunter Schirmer, et al., Owner of Record: *Robert Bosch G.m.b.H., Stuttgart, Germany,* Attorney or Agent: Michael J. Striker, Ex. Gp.: 342

3,876,498, Re. S.N. 830,915, Filed Sept. 6, 1977, Cl. 162/199, CONTROLLED FORMING WIRE SEPARATION ON IMPERVIOUS ROLL OF TWIN-WIRE PAPERMAKING MACHINE, Edgar J. Justus, Owner of Record: *Beloit Corporation, Beloit, Wis.,* Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 173

3,904,084, Re. S.N. 830,900, Filed Sept. 6, 1977, Cl. 222/105, PLASTIC BAG AND A PROTECTIVE CONTAINER THEREFOR AND A FIXTURE FOR SECURING THE BAG IN THE CONTAINER, Luigi Ukmar, et al., Owner of Record: *Montecatini Edison S.p.A., Milan, Italy,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 311

3,960,332, Re. S.N. 828,269, Filed Aug. 29, 1977, Cl. 241/46.06, DEFIBERING APPARATUS FOR PAPERMAKING STOCK, Peter Seifert, Owner of Record: *The Black Clawson Company, Middletown, Ohio,* Attorney or Agent: Lawrence B. Biebel, et al., Ex. Gp.: 325

3,981,523, Re. S.N. 829,826, Filed Sept. 1, 1977, Cl. 282/27.5, CARBONLESS MANIFOLD BUSINESS FORMS, George E. Maalouf, Owner of Record: *Moore Business Forms, Inc., Niagara Falls, N.Y.,* Attorney or Agent: James H. Marsh, Jr., Ex. Gp.: 165

4,030,791, Re. S.N. 830,228, Filed Sept. 2, 1977, Cl. 339/5 M, ELECTRICAL CONTACT SYSTEM, Wilmer Lee Sheesley, Owner of Record: *AMP Incorporated, Harrisburg, Pa.,* Attorney or Agent: William J. Keating, et al., Ex. Gp.: 325

4,032,209, Re. S.N. 831,355, Filed Sept. 7, 1977, Cl. 339/91 R, MULTIPLE SOCKET ASSEMBLY FOR ELECTRICAL COMPONENTS, John L. Rutkowski, Owner of Record: *Appleton Electric Company, Chicago, Ill.,* Attorney or Agent: Howard H. Darbo, et al., Ex. Gp.: 325

4,036,511, Re. S.N. 829,825, Filed Sept. 1, 1977, Cl. 282/27.5, CARBONLESS MANIFOLD BUSINESS FORMS, George E. Maalouf, Owner of Record: *Moore Business Forms, Inc., Niagara Falls, N.Y.,* Attorney or Agent: James H. Marsh, Jr., Ex. Gp.: 165

PATENT NOTICES

Certificates of Correction for the Week of Nov. 1, 1977

Re. 29,226	4,014,755	4,029,776	4,037,843
Re. 29,320	4,014,877	4,029,971	4,037,990
D. 242,570	4,014,919	4,030,167	4,038,056
D. 243,503	4,014,973	4,030,425	4,038,146
3,437,494	4,016,465	4,030,777	4,038,166
3,594,526	4,017,548	4,030,966	4,038,175
3,739,364	4,018,780	4,031,017	4,038,206
3,848,392	4,019,100	4,031,106	4,038,232
3,864,768	4,019,817	4,031,133	4,038,373
3,873,571	4,019,875	4,031,188	4,038,408
3,891,619	4,019,895	4,031,284	4,038,463
3,907,811	4,020,045	4,031,312	4,038,549
3,909,654	4,020,715	4,031,371	4,038,593
3,931,492	4,021,021	4,031,669	4,038,701
3,951,906	4,021,286	4,031,974	4,038,713
3,956,069	4,021,426	4,032,423	4,038,722
3,957,818	4,021,535	4,032,525	4,038,816
3,962,637	4,022,704	4,032,622	4,038,917
3,963,765	4,022,781	4,032,711	4,038,943
3,967,031	4,022,790	4,032,778	4,039,093
3,971,088	4,022,974	4,033,189	4,039,309
3,971,968	4,023,476	4,033,243	4,039,367
3,972,407	4,024,149	4,033,301	4,039,523
3,973,122	4,024,238	4,033,466	4,039,584
3,974,186	4,024,519	4,033,482	4,039,592
3,975,224	4,024,637	4,033,515	4,039,648
3,975,564	4,024,925	4,033,672	4,039,663
3,978,141	4,025,191	4,033,686	4,039,693
3,979,000	4,025,496	4,033,775	4,039,789
3,979,298	4,025,667	4,033,892	4,039,837
3,982,966	4,025,916	4,034,249	4,039,907
3,985,604	4,026,380	4,034,939	4,040,130
3,986,171	4,026,691	4,035,049	4,040,207
3,994,909	4,026,726	4,035,116	4,040,421
3,996,376	4,026,944	4,035,162	4,040,470
3,999,641	4,027,035	4,035,903	4,040,562
4,001,025	4,027,145	4,035,970	4,040,581
4,001,208	4,027,287	4,036,068	4,040,595
4,003,906	4,027,479	4,036,262	4,040,923
4,004,529	4,027,585	4,036,275	4,040,983
4,006,215	4,027,718	4,036,283	4,041,008
4,006,741	4,027,827	4,036,302	4,041,132
4,008,249	4,028,092	4,036,349	4,041,347
4,008,545	4,028,394	4,036,802	4,041,363
4,009,165	4,028,458	4,037,018	4,041,374
4,011,390	4,028,716	4,037,206	4,041,471
4,012,679	4,028,806	4,037,448	4,042,584
4,013,011	4,029,106	4,037,475	4,042,592
4,013,322	4,029,289	4,037,641	4,043,572
4,014,343	4,029,335	4,037,764	4,043,879
4,014,460	4,029,501	4,037,768	4,043,957
4,014,592	4,029,671	4,037,786	4,044,366

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 27, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-30-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-17-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-21-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-6-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	7-26-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-7-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-17-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-8-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-25-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-15-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-5-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-24-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 530—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	9-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-16-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-3-77

Expiration of patents: The patents within the range of numbers indicated below expire during August 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,947,001 to 2,951,248, inclusive
Plant Patents..... Numbers 1,963 to 1,969, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 1, 1977

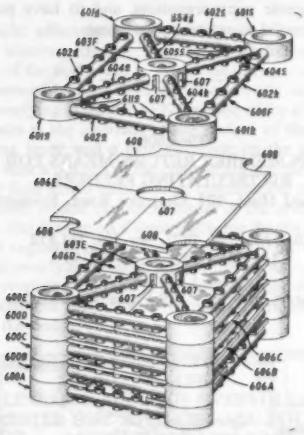
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T964,001
STRUCTURAL INTEGRATED ASSEMBLY OF RELATIVELY RIGID TUBULAR MEMBERS INCLUDING AT LEAST ONE SMALLER SUCH MEMBER EXTENDING THROUGH AND ANCHORED TO SUCH LARGER MEMBER

Thomas Norvin Ferwerda, 94 Brambach Road, Scarsdale, N.Y. 10583

Filed Jan. 28, 1977, Ser. No. 763,703
Int. Cl.[2] E04B *1/348*
U.S. Cl. 52—637
6 Sheets Drawing. 15 Pages Specification



Structural integrated assembly of relatively rigid tubular members that are formed of compositions selected from a group of metallic and plastic materials that are of the desired rigidity. The assembly includes at least a section of such relatively rigid tubular composition which is of relatively large internal cross-sectional dimensions, and at least one other relatively rigid tubular section which is in the form of a transversely smaller bridging member that extends transversely through openings in opposite sides of the relatively large tubular member there to provide two separate and spaced junctions. Suitable means integratively connect all circumambient points of the exterior surface of the smaller bridging member in each junction to all of the immediately adjacent points of the circumscribing edge of the opening in the larger tubular member thereat. The edges of the openings in the larger rigid tubular member that meet with the adjacent external surfaces of the smaller rigid member which extend therethrough are continuously anchored to the latter by joint weldings.

T964,002
METHOD TO PURIFY MAGNESIUM CHLORIDE TO PRODUCE A FLUX FOR MOLTEN MAGNESIUM

Henry A. Kuchek, 4842 S. Garfield Road, Auburn, Mich. 48611

Filed Nov. 3, 1976, Ser. No. 738,192
Int. Cl.[2] C22B *45/00*
U.S. Cl. 75—67 A
No Drawing. 7 Pages Specification

A method to remove organic impurities, such as Grignard reagents, from an impure magnesium chloride by heating the magnesium chloride in a vacuum at a temperature of up to about 500° C, and preferably from about 300° to about 500° C, and recovering a purified magnesium chloride product. The purified product is preferably added to a molten bath including potassium chloride and commercially pure magnesium chloride at a temperature of at least about 426° C and preferably from about 450° to about 760° C. The bath is thereafter solidified into a desired size and used as a flux for molten magnesium. Upon solidification, the magnesium treated with flux including the purified magnesium chloride has a finer grain size than magnesium treated with a similar flux containing commercially pure magnesium chloride.

T964,003
HARDENABLE MARTENSITIC STAINLESS STEEL

Wilson P. Rehrer, R.D. No. 2, Box 496, Reading, Pa. 19605

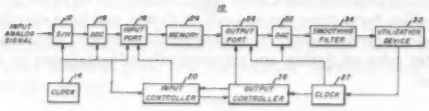
Filed Oct. 6, 1976, Ser. No. 730,003
Int. Cl.[2] C22C *38/44, 38/46, 38/48*
U.S. Cl. 75—128 G
1 Sheets Drawing. 14 Pages Specification

A corrosion resistant hardenable martensitic chromium stainless steel containing about 0.10–0.2% carbon, up to about 0.90% manganese, up to about 0.35% silicon, up to about 0.025% phosphorus, up to about 0.025% sulfur, about 11.00–12.50% chromium, about 2.00–3.00% nickel, about 1.50–2.00% molybdenum, about 0.25–0.40% vanadium, up to about 0.05% nitrogen, about 0.10–0.25% columbium, and the balance iron plus impurities. When austenitized at a temperature above about 1900° F, the steel has a grain size no coarser than about ASTM-7.

T964,004
TIME-BASE INSTABILITY COMPENSATION APPARATUS FOR USE IN COPY/DUPLICATION

L. Nevil Davy, 343 State St., Rochester, N.Y. 14650

Filed Oct. 26, 1976, Ser. No. 735,645
Int. Cl.[2] H04B *1/66*
U.S. Cl. 179—15.55 T
1 Sheets Drawing. 8 Pages Specification



Apparatus is disclosed which compensates for time-base instabilities in analog signals representative of a document image and includes an analog-to-digital converter for digitizing such analog signals, a digital storage device, such as a read/write memory, for storing such digitized signals, and a digital-to-analog converter which is adapted to be sequentially connected to selected locations of the memory to reconstruct the input analog signals for use by a printer. The read/write memory is of a wraparound variety. Further, input and output controllers are provided, having address pointers for the memory. The input pointer causes digitized analog signals to be stored in sequence at consecutive storage locations of the memory. The output pointer removes such stored digital sig-

nals from consecutive storage locations of memory and applies them to the digital-to-analog converter. These pointers are independently incremented under the control of input (document scanner) or output operations (printer), respectively, to remove surges in data flow thereby compensating for time-base instabilities.

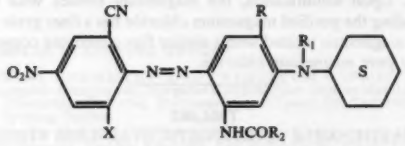
T964,005

MONOAZO DYE MIXTURES

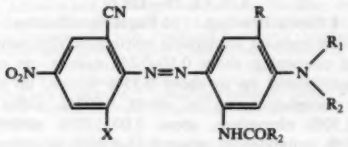
Clarence A. Coates, Jr., Rte. 8, and Gary T. Clark, 513 Montezuma Road, both of Kingsport, Tenn. 37664

Filed Mar. 10, 1977, Ser. No. 776,457
Int. Cl.[2] C09B *29/26*; D06P *3/36, 3/52*
U.S. Cl. 8—26
No Drawing. 10 Pages Specification

Mixtures of monoazo dyes having at least one dye of the formula



and at least one dye of the formula



wherein X is chlorine, bromine, alkylsulfonyl of 1 to 6 carbon atoms, CN, CF_3 or NO_2; R is hydrogen or alkyl or alkoxy of 1 to 6 carbon atoms; R_1 is hydrogen, alkyl or alkoxy of 1 to 6 carbon atoms or alkyl of 1 to 6 carbon atoms substituted with phenyl, hydroxy or alkanoyloxy of 1 to 6 carbon atoms; R_2 is hydrogen, cyclohexyl, phenyl, alkoxy or alkyl of 1 to 6 carbon atoms or alkyl of 1 to 6 carbon atoms substituted with phenyl, chloro, phenoxy or alkoxy of 1 to 6 carbon atoms; and R_3 has the same meaning as R_1 excluding hydrogen. These mixtures produce bright, fast blue shades on polyester fibers having excellent fastness to light, wash, crock, gas, acid or base perspiration and sublimation. These mixtures have excellent pH stability over a range of 4–8 when applied to polyester above the boil, typically 220° to 275° F. These mixtures have superior build-up characteristics, color yield, exhaustion on to the fiber, leveling, barre coverage and rate of dyeing and have excellent shade reproducibility. The excellent saturation values and faster rates of dyeing are economically advantageous to the dyer.

T964,006

ANTIMICROBIAL FATTY ESTER-AMIDES

August V. Bailey, 4470 San Marco Road, New Orleans, La. 70129; Gordon J. Boudreaux, 6625 Dorian St., New Orleans, La. 70126; Gene Sumrell, 1540 Aviators St., New Orleans, La. 70122, and Arthur F. Novak, 656 College Hill Drive, Baton Rouge, La. 70808

Division of Ser. No. 667,063, March 15, 1976, Pat. No. 4,017,522. This application Feb. 15, 1977, Ser. No. 768,808
Int. Cl.[2] C09F *5/00*
U.S. Cl. 260—404
No Drawing. 15 Pages Specification

New ester-amides containing one or more long chain fatty acyl groupings are described which have antimicrobial activity against several pathogenic microorganisms, and have properties making them useful as antimicrobial agents.

T964,007

ANTIMICROBIAL ESTERS OF ALIPHATIC DIOLS

August V. Bailey, 4470 San Marco Road, New Orleans, La. 70129; Gordon J. Boudreaux, 6625 Dorian St., New Orleans, La. 70126; Gene Sumrell, 1540 Aviators St., New Orleans, La. 70122, and Arthur F. Novak, 656 College Hill Drive, Baton Rouge, La. 70808

Division of Ser. No. 667,055, March 15, 1976, Pat. No. 4,024,164. This application Feb. 15, 1977, Ser. No. 768,807
Int. Cl.[2] C09F *5/08, 7/10*
U.S. Cl. 260—410.5
No Drawing. 12 Pages Specification

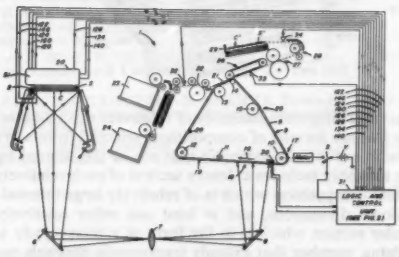
New mixed esters of diols having one hydroxyl group esterified with benzoic acid and the other esterified with various saturated or unsaturated aliphatic acids or aromatic acids other than benzoic are found to have antimicrobial activity against several pathogenic microorganisms, and to have properties making them useful as antimicrobial agents.

T964,008

SEPARATION MEMBER RETURN MEANS FOR USE IN RECIRCULATING FEEDERS

William Edward Hunt, 901 Elmgrove Road, Rochester, N.Y. 14650

Filed Mar. 28, 1977, Ser. No. 781,812
Int. Cl.[2] G03B *27/48, 27/50*
U.S. Cl. 355—50
3 Sheets Drawing. 19 Pages Specification



A recirculating feeder adapted to be coupled to a copier is set forth which employs a separator member that initially engages the top document sheet of a multi-sheet document in a tray and incrementally moves downwardly under the influence of gravity as individual document sheets are fed from the bottom of the multi-sheet document to the copier exposure platen and returned to the top of the multi-sheet document in the tray. After the sheet initially engaged by the separator member is fed, the separator member moves downwardly to be spaced from the tray and a motor control circuit is activated which energizes a motor. The energized motor drives the separator member towards return engagement with the top document sheet of the multi-sheet document in the tray. Prior to the separator member returning to such engagement, the control circuit de-energizes the motor and connects it to a dynamic brake circuit which retards the rotation of the motor and movement of the separator member to the extent that the separator member gently re-engages the top document sheet, and does not damage it.

T964,009

HIGH VOLTAGE SEMICONDUCTOR STRUCTURE

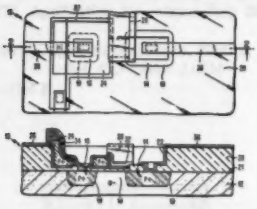
Te-Long Chiu, 25 Hilltop Drive, Wappingers Falls, N.Y. 12950, and Madhukar B. Vora, Taconic Drive, Hopewell Junction, N.Y. 12533

Continuation of Ser. No. 547,912, Feb. 6, 1975, abandoned, which is a continuation of Ser. No. 361,101, May 17, 1973, abandoned. This application Apr. 5, 1976, Ser. No. 673,510

Int. Cl.[2] H01L *29/78*

U.S. Cl. 357—23

1 Sheets Drawing. 9 Pages Specification



In a field effect transistor having a semiconductor body, spaced source and drain regions, an insulating layer on the surface of the body, and an electrode to the source region, the improvement being a field shield electrode on the insulating layer overlying at least the PN junction of the drain region that terminates at the interface of the surface of the body and the insulating layer, and a gate electrode on the insulating layer over at least a portion of the channel region, the gate electrode and the field shield electrode in combination overlying all of the channel region. Another feature of the invention is a high voltage line for use on a semiconductor device consisting of a diffused region of opposite conductivity in the semiconductor body, an overlying insulating layer having an opening therein, and an overlying field shield conductive stripe that overlies the PN junction of the diffused region that terminates at the surface of the body.

T964,010

NON-LINEAR RESISTANCE OVERVOLTAGE SURGE ARRESTER DISC WITH CERAMIC COLLAR AND METHOD FOR APPLYING

John J. Pitha, 165 Walker St., Lenox, Mass. 01240, and Howard F. Ellis, Stephentown, N.Y. 12168

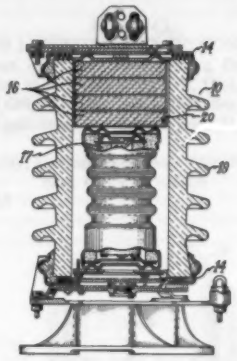
Continuation of Ser. No. 735,072, Oct. 22, 1976, which is a division of Ser. No. 576,324, May 12, 1975, abandoned. This application May 2, 1977, Ser. No. 792,586

Int. Cl.[2] B05D *3/02, 5/12;* H01C *7/12*

U.S. Cl. 428—210

1 Sheets Drawing. 11 Pages Specification

A zinc oxide compound nonlinear resistance overvoltage surge arrester disc is provided with a low temperature-curing ceramic antiflashover collar having relatively low coefficient of thermal expansion of about 4.5×10^{-6}. The cured ceramic comprises the reaction product of a dry mixture of 80% by weight of mullite refractory filler and 20% kaolin suspending clay, together with 5% to 15% of the weight of the dry mixture of a binder consisting of equal weights of monoaluminum phosphate and concentrated phosphoric acid.



Also disclosed is a method of application comprising the steps of applying the slurry to the perimeter of the disc and baking at a temperature below about 600° Celsius.

T964,011

ADHESIVE COMPOSITIONS HAVING A CARBON BLACK COMPONENT

Thomas C. Blanken, 3 Badhuisweg, Amsterdam, Netherlands

Filed Feb. 28, 1977, Ser. No. 772,810

Claims priority, application United Kingdom, Mar. 30, 1976, 12744/76

Int. Cl.[2] C08L *95/00, 53/02;* B32B *11/04, 27/00*

U.S. Cl. 428—489

No Drawing. 10 Pages Specification

Article provided with a pressure-sensitive adhesive layer composition, which composition is characterized by improved flow resistance at high temperatures (e.g. at 90° C), and which comprises 50–97 parts by weight of a bituminous component dispersed in an extender oil, 3 to 50 parts by weight of at least one thermoplastic polymer, which is preferably a block polymer having the general structure:

A—B—(B-A)n

where A is a monoalkenyl arene block, B is a conjugated diene block, and n is an integer from 1–15, and 5 to 50% by weight (based on the combined weight of the bituminous component and the thermoplastic polymer) of a carbon black having an oil absorptivity of above 80 milliliters per 100 grams. Such articles usually possesses good low temperature flexibility, tack and adhesive strength.

REISSUES

NOVEMBER 1, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,462

LUMINOUS OUTDOOR SIGN BOARD RESISTANT TO INCLEMENT WEATHER

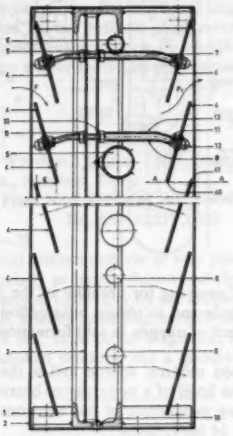
Rene Verazin Tchakgarian, 19, Avenue Charles de Gaulle, Autun (Saone et Loire), France

Original No. 3,837,105, dated Sept. 24, 1974, Ser. No. 331,334, Feb. 9, 1973. Application for reissue July 26, 1976, Ser. No. 708,593

Claims priority, application France, Nov. 2, 1972, 72.38851

Int. Cl.[2] G09F *13/04*

U.S. Cl. 40—130 R 6 Claims



1. A luminous outdoor sign board adapted to resist inclement weather comprising:

a framework in the form of a case defining a pair of opposed open sides,

support means within the case including a plurality of rods extending toward said opposed open sides of the case,

a plurality of parallel translucent slats,

each slat being supported by attachment to a plurality of said rods, the attachment between each slat and its support rods being located at spaced points along the centerline axis of the slat for allowing free expansion of the edges of the slats,

said parallel translucent slats being positioned in the open sides of said case with the edges of said slats when seen in the vertical plane being continuous, so that when standing back the viewer obtains the impression that he is facing a plane surface,

said slats being inclined in the same direction to form between them lateral interstices extending over their entire length for allowing the wind and rain water to pass freely through the sign board both horizontally and vertically for making the sign board aerated and self-washing,

letters forming a message being fixed on the slats, and

lighting means located in the case illuminating from the inside said translucent slats and said letters on the slats.

Re. 29,463

TANKER FOR LIQUIFIED AND/OR COMPRESSED GAS

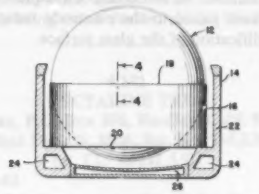
Ragnar Bognaes, Jeloy, and Olav Solberg, Oslo, both of Norway, assignors to Kvaerner Brug A/S, Olso, Norway

Original No. 3,680,323, dated Aug. 1, 1972, Ser. No. 81,101, Oct. 15, 1970. Application for reissue Dec. 21, 1976, Ser. No. 752,897

Claims priority, application Norway, Oct. 10, 1969, 694145

Int. Cl.[2] F17C *13/08*

U.S. Cl. 62—55 31 Claims



1. Apparatus for storing liquified gas in combination with a cargo tank on board a marine vessel having a hull structure, said tank being generally curvilinear in cross section, and said apparatus comprising skirt means operably interconnecting said tank and said hull structure for supporting said tank on said structure, said skirt extending tangentially to said tank and having one end thereof integrally connected to said hull structure and the other end thereof integrally connected to said tank along a peripheral portion thereof, and separate means for maintaining a low temperature condition within said tank to maintain said gas in its liquid phase.

Re. 29,464

MANUFACTURE OF GLASS

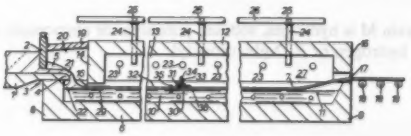
David Gordon Loukes, Prescot; William Ramsey Maltman, and Colin Robert Howard, both of St. Helens, all of England, assignors to Pilkington Brothers Limited, St. Helens, England

Original No. 3,958,969, dated May 25, 1976, Ser. No. 525,279, Nov. 19, 1974. Application for reissue Mar. 10, 1977, Ser. No. 776,471

Claims priority, application United Kingdom, Nov. 23, 1973, 54497/73

Int. Cl.[2] C03B *18/02*

U.S. Cl. 65—30 E 29 Claims



1. In a method of modifying a glass surface *to produce patterned glass* in which glass is contacted with a molten metal body while the glass is at a temperature at which it is susceptible to surface modification, relative movement is effected between the molten metal body and the glass, and migration of cations from the molten metal body into the glass surface is electrically induced *by subjecting the glass to anodic treatment,* the improvement comprising periodically during said migration connecting said molten metal body as a cathode with respect to the glass for a preset time by the transmission of cathodic pulses of preset duration to the molten metal body,

and regulating the quantity of electricity passing in each cathodic pulse *and a preset time interval between the end of each cathodic pulse and the beginning of the next anodic treatment* to [a value] *values* sufficient at least partially to de-oxidise the molten metal body.

20. Apparatus for manufacturing *patterned* glass with a modified surface comprising an electrically conductive contact for one surface of the glass, electrode means for maintaining a body of molten metal in contact with the other surface of the glass, an electrical supply source connected to said contact and to said electrode means through a switchable supply circuit, and a control waveform generator connected to said switchable supply circuit and including settable means operable to cause the generator to produce a control waveform consisting of a sequence of switching pulses for application to the switching circuit to control the switching of a sequence of anodic and cathodic current pulses to the electrode means to effect the required modification of the glass surface.

Re. 29,465

PSORIASIS TREATMENT WITH MYCOPHENOLIC ACID

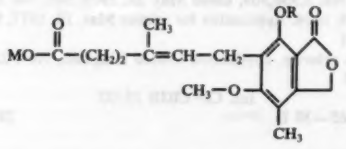
Irving S. Johnson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Original No. 3,777,020, dated Dec. 4, 1973, Ser. No. 280,626, Aug. 14, 1972. Continuation-in-part of Ser. No. 191,824, Oct. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 93,432, Nov. 27, 1970, abandoned. Application for reissue Nov. 24, 1976, Ser. No. 744,553

Int. Cl.[2] A61K *31/70, 31/335*

U.S. Cl. 424—180 **2 Claims**

1. A method of treating psoriasis comprising the *oral* administration to a human suffering from psoriasis [either orally or topically] of an effective amount for treating psoriasis of a compound of the formula:



wherein M is hydrogen, sodium, potassium or ammonium and R is hydrogen or β-D-glucuronidyl.

Re. 29,466

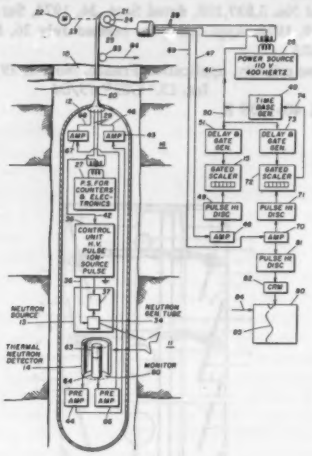
IN-SITU ASSAYING FOR URANIUM IN ROCK FORMATIONS

Wyatt W. Givens; Richard L. Caldwell, and William R. Mills, Jr., all of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Original No. 3,686,503, dated Aug. 22, 1972, Ser. No. 38,244, May 18, 1970. Application for reissue May 7, 1976, Ser. No. 684,133

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—269 **11 Claims**



1. A method of assaying for uranium in the formation traversed by a borehole and to obtain information indicative of the interfering effect of oxygen in said formations, comprising the steps of:

locating a pulsed neutron source and a thermal neutron detector at the level of a nonuranium-bearing formation, said source being productive of fast neutrons having energies of about 14 Mev,

Operating said source to periodically irradiate said nonuranium-bearing formation with bursts of fast neutrons spaced in time,

detecting neutrons resulting from the irradiation of said nonuranium-bearing formation and indicative of delayed neutrons emitted by oxygen as a result of irradiation by neutrons,

locating said source and detector at the level of a formation of interest suspected of containing uranium,

operating said source to periodically irradiate said formation of interest with bursts of fast neutrons spaced in time, and

detecting neutrons resulting from the irradiation of said formation of interest to detect for delayed neutrons emitted as a result of neutron fission of uranium.

PLANT PATENTS

GRANTED NOVEMBER 1, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,138

ROSE PLANT

J. Benjamin Williams, 2800 Elnora St., Silver Spring, Md. 20902

Filed Oct. 21, 1976, Ser. No. 734,453

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—17 **1 Claim**

1. A new and distinct variety of rose plant of the grandiflora class, substantially as shown and described, characterized particularly by recurrent flowers borne singly and in sprays of 3 to 5 blooms having brilliant orange-red cast at the inner petals with iridescent quality on an upright compact plant of above average winter hardiness and disease resistance.

4,139

ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Nov. 17, 1976, Ser. No. 742,466

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its very vigorous, heavily branched, upright plant; bud and flower color of dark red; little or no fragrance; average number of downward hooked prickles; and a goodly degree of mildew resistance.

4,140

PLUM TREE

Dennis Surabian, P.O. Box 206, Reedley, Calif. 93654

Filed Dec. 29, 1976, Ser. No. 755,354

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized by its vigorous growth and regular bearing of large, yellow fleshed when ripe, freestone fruit whose flesh becomes brilliantly red in storage; and by its general resemblance to the Laroda (unpatented) plum tree from which it is distinguished by its earlier appearing final skin coloration and from which it is further distinguished by such coloration being much darker, almost black.

4,141

NECTARINE TREE

Dennis Surabian, P.O. Box 206, Reedley, Calif. 93654

Filed Dec. 29, 1976, Ser. No. 755,228

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, characterized by its vigorous growth; its bearing of large, freestone, yellow fleshed fruit; and by its general resemblance to the Fantasia (unpatented) Nectarine Tree, but from which it is distinguished by its fruit ripening from 14 to 19 days earlier.

4,142

ESCALLONIA (COMPAKTA) PLANT

Louis E. Gavello, 3436 Maricopa Ave., Richmond, Calif. 94804

Filed Oct. 19, 1976, Ser. No. 734,371

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of Escallonia plant, substantially as illustrated and described and characterized as to novelty by:

a. the very compact mounding form of the plant having a low height and spread greater than its height;
b. the distinct pink color of the flowers;
c. the long blooming period;
d. its resistance to weather and disease;
e. its slow growth and controlled habit, making it a very suitable plant for restricted areas.

PATENTS

GRANTED NOVEMBER 1, 1977

ERRATA

For CLASS	See PATENT NO.
053–247	4,055,943
187–052 R	4,056,162
141–392	4,056,234
366–160	4,056,258
366–015	4,056,259
366–144	4,056,260
296–137 G	4,056,274
536–004	4,056,322
428–565	4,056,365
428–653	4,056,366
360–106	4,056,518
544–146	4,056,526
544–194	4,056,527
548–360	4,056,533
460–126	4,056,551
560–128	4,056,552
560–043	4,056,553
560–060	4,056,554
560–053	4,056,555
560–053	4,056,556
560–060	4,056,557
560–151	4,056,558
526–212	4,056,559
560–231	4,056,562
560–245	4,056,563
426–577	4,056,566
235–030 R	4,056,709
235–437	4,056,710
364–200	4,056,711
365–205	4,056,810
365–189	4,056,811
365–015	4,056,812
365–012	4,056,813
365–008	4,056,814

PATENTS

GRANTED NOVEMBER 1, 1977

ERRATA

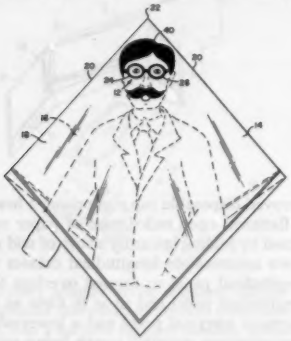
PATENTS

GRANTED NOVEMBER 1, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

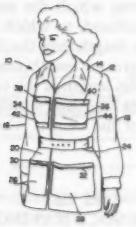
GENERAL AND MECHANICAL

4,055,852
DISPOSABLE RAIN PROTECTOR
William E. Wallace, 1851 Arlington St., Sarasota, Fla. 33579
Filed Dec. 10, 1975, Ser. No. 639,452
Int. Cl.[2] A41D *9/00*
U.S. Cl. 2—84 **6 Claims**



1. A disposable rain protector comprising: canopy means formed from a flexible sheet material and defining a predetermined configuration; and cohesion inhibitor means comprising a positive electrostatic charge disposed on opposite surface portions of said flexible sheet material and coextensive with said surface portions, whereby adherence of said flexible sheet material to itself and to the user thereof is substantially reduced.

4,055,853
CONVERTIBLE COAT AND TOTE BAG
Gloria Argento, 14718 Cranbrook, Hawthorne, Calif. 90250, and Margaret Strandt, 14835 Dublin Ave., Gardena, Calif. 90249
Filed Jan. 24, 1977, Ser. No. 762,114
Int. Cl.[2] A41D *3/02*
U.S. Cl. 2—93 **8 Claims**



1. A garment convertible from an outer coat to a tote bag comprising:
an outer garment having at least a front portion, a collar portion and a back portion,
a belt completely encircling said front portion and said back portion thereby defining an upper portion and a lower portion,
a first pair of deep pockets having access ports on the uppermost portion and located on the front lower portion of the jacket,
a second pair of deep pockets having access ports on both the uppermost portion and the lowermost portion and located on the front upper portion of said garment,
locking snaps located on said collar portion and the central portion of said back portion for holding said collar portion close to the back portion when folded, and
hooks located on the longitudinal outside edges of said first pair of pockets and said second pair of pockets and adapted to be interconnected when said upper portion and said lower portion are folded about said belt thereby forming a tote bag with the belt as the handle or strap and said first pair of pockets located on one side of the strap and said second pair of pockets located on the other side of said strap.

4,055,854
VERSATILE STRETCH KNIT GARMENT
Nathaniel P. Jones, Stuhr Garden Apartments, Apartment 7B, Frost Lane, Peekskill, N.Y. 10566
Filed Jan. 24, 1977, Ser. No. 761,620
Int. Cl.[2] A41D *1/22*
U.S. Cl. 2—105 **10 Claims**

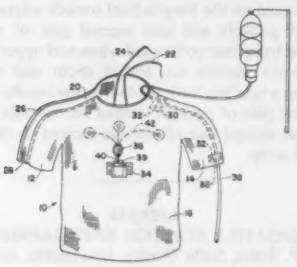
1. A versatile garment which is especially adapted to be worn as an item of brief female outerwear and which can be worn in many different ways to provide many different appearances comprising a structure which is substantially symmetrical about a center-line including a substantially flat double stretch knit body including a base portion and two separate upstanding portions formed integrally with said base portion,
said upstanding portions being substantially straight and equal in vertical length and diverging away from the center-line at the upper ends thereof,
said upstanding portions each being uniformly tapered to substantially a point at the upper end thereof,
the unstretched length of said upstanding portions measured from the bottom of said base portion being more than fifty percent greater than the chest measurement of the intended wearer,
the unstretched basic width of said base portion being about equal to four tenths of said chest measurement,
the separation between said upstanding portions beginning at a vertical dimension measured from the bottom of said base portion which is about equal to one third of said chest measurement when said garment is in the unstretched condition.

4,055,855

HOSPITAL GOWN

Alexander C. Ragone, 38 Celestial Lane, Levittown, N.Y. 11756, and Inez Ragone, 1885 Leonard Lane, Merrick, N.Y. 11566

Filed July 19, 1976, Ser. No. 706,302
Int. Cl.[2] A41B 9/00
U.S. Cl. 2—114 8 Claims



1. A hospital gown comprising:
at least two panels used to cover the front and back of the upper torso and arms of a patient,
means for removably securing said panels together about the upper torso and arms of a patient to form a garment having a pair of sleeves and an upper torso enveloping portion,
a pocket on a front surface of the upper torso enveloping portion of said garment for holding a medical diagnostic instrument, and
an opening through the upper torso enveloping portion of said garment for attaching said medical instrument to the patient.

4,055,856

CHILD'S TOY HALO

Walter M. Dirham, Norman, Okla., assignor to Osher M. Bachrach, Norman, Okla.

Filed Nov. 3, 1975, Ser. No. 627,831
Int. Cl.[2] A42C 1/00
U.S. Cl. 2—192 1 Claim

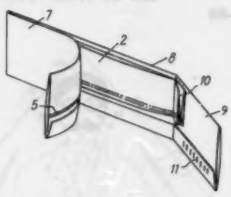
1. A method for making a halo device comprising:
bifurcating an elongated flat blank of flexible material of substantially rectangular shape by removing a strip from a central portion thereof to form a pair of elongated, spaced legs joined at one end by a web portion;
folding said web portion upon itself to form a multi-layered supporting column extending between said spaced legs; and
bending the spaced legs into two spaced bands and securing the free ends of the legs to said multi-layered supporting column formed from said folded web portion.

4,055,857

DISPOSABLE CAPS

Richard Louis Brucciani, Leicester, England, assignor to The Paper Lynen Co. Ltd., England

Filed Sept. 29, 1975, Ser. No. 617,658
Claims priority, application United Kingdom, Oct. 16, 1974, 44916/74
Int. Cl.[2] A42B 1/22
U.S. Cl. 2—197 1 Claim



1. An improved disposable cap comprising a headband consisting of a flattened open-ended tube of paper or like sheet material formed by folding inwardly a strip of said paper or the like along two intermediate longitudinal creases so that one marginal longitudinal panel so formed overlaps the opposite marginal longitudinal panel and so as to form an outer panel and an uppermost marginal panel and a lowermost marginal panel, said overlapping marginal panels being secured by an adhesive, and said lowermost panel lying inwardly of said outer panel and said uppermost panel to form a headband, the uppermost panel being substantially wider than the lowermost panel and overlapped by said lowermost panel by a substantial amount so that a triple thickness of said panels is provided in the area of said headband, said tube being provided intermediate its length with transverse creases dividing the tube into three sections and enabling the tube to be folded into a closed annulus with one end of the flattened open-ended tube inserted within the outer end of said tube, and a crown composed of an accordion-pleated sheet of paper or like sheet material which is secured by an adhesive at the lateral edges thereof to and between two opposed overlapped uppermost outer marginal longitudinal panels of the folded headband tube, leaving a third section of said tube free and in overlapping relationship to the sections to which the crown is connected, whereby the annulus is maintained in shape solely by the force of friction between the layers of material from which the annulus is made, the second section of the headband, to which the third section is attached, being of greater length than the first section, and the pleated crown being of greater length than the second headband section and the surplus length of this crown being secured by an adhesive to the third headband section to provide crown material for expansion of the crown when the headband is expanded.

4,055,858

WITHIN-THE-SHOE SOCK HAVING REMOVABLE RETAINING DEVICE

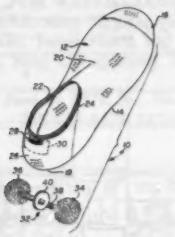
William J. Traenkle, 61 Old Ox Road, Manhasset, N.Y. 11030

Filed June 23, 1975, Ser. No. 589,444
Int. Cl.[2] A41B 11/00; A43B 19/00
U.S. Cl. 2—240 18 Claims

1. A within-the-shoe sock construction comprising a sock having a foot opening adapted to receive a foot therethrough, the height of said sock being substantially coextensive with the height of a shoe to be worn with said sock whereby the upper rear edge of the sock is substantially coterminus with the upper rear edge of the shoe; retaining means detachably secured to said sock and engageable with the rear edge of a shoe for retaining said sock in position on the foot of the wearer, said retaining means comprising an enlarged member, and a relatively narrow support member connected to said enlarged

member; an opening in the rear of said sock receiving said narrow support member therethrough; and securing means engaging the portion of said support member extended through said opening to prevent withdrawal of said portion from said opening.

18. Detachable retaining means for retaining in position on the foot of the wearer a within-the-shoe sock of the type having a foot opening adapted to receive a foot therethrough, the height of the sock being substantially coextensive with the height of a shoe to be worn with the sock whereby the upper rear edge of the sock is substantially coterminous with the upper rear edge of the shoe; said retaining means comprising an



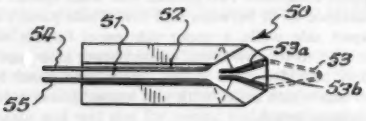
enlarged member adapted to be disposed outside of the shoe and in engagement therewith to prevent downward movement of said sock, and a narrow support member connected to said enlarged member and having a section adapted to extend through the rear of the sock to be detachably secured thereto, said enlarged member comprising a pair of pompons, said narrow supporting member comprising a ribbon extending between said pair of pompons and having one end connected to one of said pompons and the other end connected to the other of said pair of pompons, and a relatively thin button secured to said ribbon intermediate said pompons and adapted to be received in a button hole at the rear of the sock.

4,055,859

METHOD AND MACHINE FOR MAKING A GARMENT

Charles B. Green, Lewisburg, and Joseph R. Sholter, Weikert, both of Pa., assignors to International Paper Company, New York, N.Y.

Filed Feb. 20, 1975, Ser. No. 551,378
Int. Cl.² A41D *13/04*; A41H *43/00*
U.S. Cl. 2—243 R **4 Claims**



1. In a method for making a garment from a continuous web of material, during movement of the web along a feed path, which comprises the steps of: directing the web along the feed path; dividing the web into successive sheets; successively directing the cut sheets along the feed path; positioning a narrow strip of material across the sheet, so that the strip extends in a direction perpendicular to the sheet's direction of movement along the feed path, with the end portions of the strip protruding from the opposite sides of the sheet; moving the center portion of the strip with a depending member in the sheet's direction of movement along the feed path and through two spaced guides located along the fred path between the opposite sides of the sheet, so that: the strip has a generally V-configuration, its center portion protruding from the sheet, its end portions protruding from opposite sides of the sheet and its leg portions, between the center portion and the end portions thereof, being positioned adjacent opposed corner portions of the sheet; folding the opposed corner portions of the sheet over the adjacent leg portions of the strip and into contact with the body of the sheet on the otherside of the leg portions of the strip; securing the corner portions to the contacted body portions of the sheet to maintain the strip in fixed relationship with the sheet; moving the center portion of the strip with the depending member opposite to the sheet's direction of movement along the feed path and through the two spaced guides located along the feed path to invert the strip so that it has a generally W-configuration, its center portion forming generally a V-configuration above the sheet, and its leg portions maintained in fixed relationship with the sheet through the folded opposed corner portions of the sheet and forming the outer legs of the W; and severing the strip at the apex of the center portion, the improvement in inverting and severing the center portion which comprises

maintaining contact between the depending member and the center portion of the inverted strip at about the apex of its V-configuration subsequent to its positioning above the sheet; and

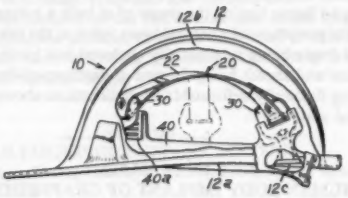
moving the depending member in a direction opposite the sheet's direction of movement along the feed path to sever the center portion of the strip at about the apex of its V-configuration.

4,055,860

SAFETY CAP WITH ENERGY ABSORBING SUSPENSION

John H. King, Lilburn, Ga., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 716,829, Aug. 23, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 772,742
Int. Cl.² A42B *3/02*
U.S. Cl. 2—416 **19 Claims**



1. A safety cap with energy absorbing suspension comprising:

a relatively rigid shell having

a generally convex exterior wall portion and adjoining concave internal cavity extending from a lower edge and adapted to extend around and receive an upper portion of a wearer's head,

anchor means angularly spaced around adjacent the lower edge of the convex wall portion for attaching the suspension to the shell;

an energy absorbing suspension attached to the anchor means and having

crown straps spaced from the shell and situated within the internal concave cavity between the anchor means for supporting engagement with the wearer's head,

connecting means attached to and connecting the crown straps to the shell and each of the connecting means having

an end portion attached to one of the anchor means,

an elastically and plastically deformable energy absorbing portion attached to an end portion of a crown strap, and

control means adjacent to and engageable by the energy absorbing portion for first allowing elastic deformation of, then controlling and limiting plastic deformation of the energy absorbing portion;

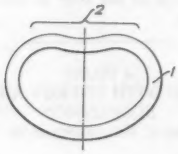
whereby energy of an impact against and displacing the shell is absorbed by first placing the crown straps engaging and resisted by the wearer's head in tension and pulled tightly against the energy absorbing portions to firmly seat the end portions of the connecting means against the anchor means after which the crown straps elastically and then plastically deform the energy absorbing portions into engagement with the adjacent control means.

4,055,861

SUPPORT FOR A NATURAL HUMAN HEART VALVE

Alain Carpentier, Paris; Xavier Leclercq, Orgeval, and Jean Paris, Saint-Denis, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 9, 1976, Ser. No. 675,592
Claims priority, application France, Apr. 11, 1975, 75.11361
Int. Cl.[2] A61F *1/22, 1/24*
U.S. Cl. 3—1.5 9 Claims



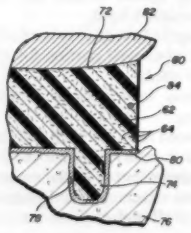
9. A support for a natural human valve, said support consisting of an elongated flexurally deformable frame having a longitudinal axis curved along its length to define a generally ring-shaped frame having the shape of at least a substantial portion of the periphery of a natural heart valve at the base of its cusps, said frame being substantially enclosed in a textile sheath, said frame and sheath being formed of biocompatible material and being flexurally deformable in all directions about said longitudinal axis.

4,055,862

HUMAN BODY IMPLANT OF GRAPHITIC CARBON FIBER REINFORCED ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE

Gene M. Farling, Warsaw, Ind., assignor to Zimmer USA, Inc., Warsaw, Ind.

Filed Jan. 23, 1976, Ser. No. 651,706
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 6 Claims



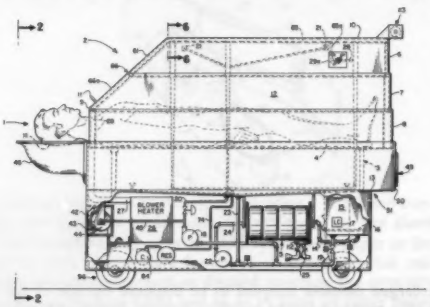
1. A medical implant element which is to be subjected to rolling or sliding pressure or a combination of such pressures in the human body, comprising: a plurality of microparticles of ultra-high molecular weight polyethylene resin fused together into a matrix; and a quantity of graphitic carbon, consisting essentially of a substantially unoriented array of short, random length fibers, disposed in interstices of said matrix, said graphitic carbon fiber-containing matrix being a wear-resistant, substantially isotropic member.

4,055,863

APPARATUS FOR BATHING PERSONS

Lawrence Edward Duval, 219 Chestnut St., Denham Springs, La. 70726

Filed Dec. 22, 1975, Ser. No. 642,723
Int. Cl.[2] A47K *3/06;* A61H *33/00*
U.S. Cl. 4—173 R 7 Claims



1. An apparatus for bathing a person which comprises:
a. compressed air producing means;
b. a drainable frame structure;
c. a bedding frame assembly attached to said frame structure and capable of supporting said person in and about horizontal position;
c. a canopy assembly attached to said frame structure to form a water-tight chamber about said persons body, said canopy assembly comprising:
i. a lower side panel and an upper side panel telescopically received in said lower said panel wherein said lower side panel comprises; two parallel spaced apart side walls, a bottom wall attached to said parallel side walls at their lower end and provided with locking means to limit the heighth to which said lower side panel may rise, and a top wall attached to said parallel side walls at the upper end and provided with a second locking means to contact and limit the height to which said upper side panel may rise, and wherein said upper side panel comprises: two parallel side walls spaced apart a distance to fit between said lower side panel's spaced apart side walls, a upper side panel bottom wall attached to the lower end of said upper side panel walls and provided with a first upper side panel locking means which mates with said second lower side panel locking means,
ii. a retractable top shade including means attachable to said upper side panel to form a water-tight seal above said body, and;
iii. a front neck panel plate attachable to said lower side panel to form a water tight seal about said persons neck, and;
iv. means for introducing said compressed air to said upper and lower side panels for raising said upper side panel to a position whereby said upper side panel locking means contacts and second lower side panel locking means;
e. Spray nozzles attached to said frame structure including said upper side panels and positioned about said bedding frame structure to spray water to all areas of said person's body lying on said
bedding frame assembly;
f. means for providing said water to said spray nozzles, said means connected to said spray nozzles;
g. Air ducts attached to said frame structure and having duct

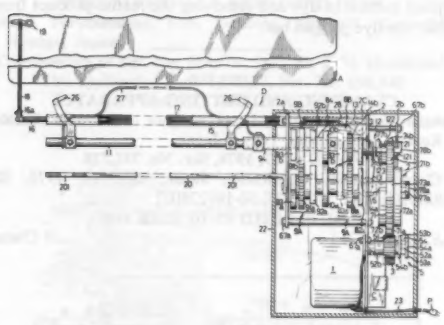
openings positioned about said bedding frame assembly and directed to force air from said compressed air means to all areas of said person's body lying in said bedding frame assembly; and.

4,055,864

AUTOMATIC LID-LIFTING AND FLUSHING DEVICE FOR WATER CLOSET

Yu-Hsing Liu, No.7-3, Alley 15, Lane 667, Chung Shan Road, Sec. 2, Chung Ho, Taipei Hsien, and Fon-Wen Chiu, 11th Floor, No. 220, Sung Chiang Road, Taipei, both of China /Taiwan

Filed June 14, 1976, Ser. No. 695,786
Int. Cl.[2] A47K *13/00*
U.S. Cl. 4—253 **11 Claims**



1. A control mechanism in combination with a water closet having a bowl, a flush tank, a raisable and closable lid, a raisable and closable seat and a flushing mechanism, said control mechanism being operable to automatically control the raising and lowering movements of said lid and seat as well as the actuation of said flushing mechanism, said control mechanism comprising:

a casing;

a low speed motor mounted in said casing;

motor actuated means operably connected to be driven by said motor;

lid operating means interconnecting said motor-actuated means and said lid for raising and lowering said lid;

seat operating means interconnecting said motor-actuated means and said seat for raising and lowering said seat;

electric control means electrically connected to said motor, said electric control means comprising:

a first manually operable switch for actuating said motor and said motor-actuated means through a lid-raising sequence in which said lid operating means raises said lid;

a second manually operable switch for actuating said motor and said motor-actuated means through a seat-raising sequence in which said seat operating means raises the seat; and

a third manually operable switch for actuating said motor and said motor-actuated means in reverse for closing said seat if the latter is raised and for closing said lid; and

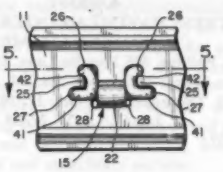
flush operating means interconnecting said flushing mechanism and said motor-actuated means and being driven by the latter only during said reverse actuation thereof in response to operation of said third switch, to flush said bowl.

4,055,865

SPRING ATTACHMENT ASSEMBLIES

Lawton H. Crosby, Lake Bluff, Ill., and Thomas H. Keane, Morristown, Tenn., assignors to Morley Furniture Spring Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 501,155, Aug. 28, 1974, Pat. No. 3,971,082. This application June 16, 1976, Ser. No. 696,544
Int. Cl.[2] A61J *19/00*; F16F *1/46*
U.S. Cl. 5—259 R **4 Claims**



1. A rail attachment assembly for attaching an end of a sinuous spring band to a vertical flange of a steel frame rail, comprising:

a. a pair of apertures formed through said flange in spaced relationship longitudinally of said flange,

b. a portion of the segment of said flange between said apertures being deformed inwardly of said flange,

c. said deformed portion defining at least two co-extensive concave surfaces extending longitudinally of said flange between said apertures,

d. said two co-extensive concave surfaces comprising a first surface having a greater radius of curvature and a second surface having a lesser radius of curvature,

e. said second surface being formed horizontally inwardly of said vertical flange from said first surface, and

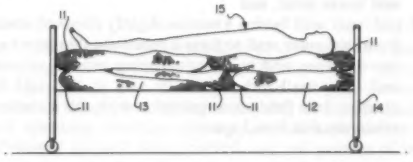
f. a wire-like element on the end of said band seated on one of said concave surfaces to attach said band to said rail with said band extending generally horizontally away from said vertical flange.

4,055,866

POLYMORPHIC SUPPORT SYSTEMS

Franklin Temple Evans, Homewood Road, Ferry Farms, Annapolis, Md. 21402

Filed Jan. 19, 1976, Ser. No. 650,353
Int. Cl.[2] A47C *3/00, 27/08*
U.S. Cl. 5—367 **10 Claims**



1. A polymorphic body support system comprising a base structure including a generally planar supporting surface dimensioned to receive a person thereon, a plurality of unattached, individual closed flexible bags contiguously arranged on said base structure, said contiguous arrangement including at least a single layer of said bags, said contiguous arrangement between said unattached, individual bags and the quantity of said bags being infinitely variable, at the discretion of the user prior to or during use, each of said bags containing a plurality of beads, said beads being characterized as non-absorbent, non-compressible and capable of free flow with respect to each other within said bag when subjected to the weight of a body member so that the upper surface of the bag conforms to the

body member supported thereon, each of said contiguous flexible bags being independently responsive to the compressive force component resulting from the presence of the body member and jointly responsive to the lateral force components to provide a comfortable contour support for the person.

4,055,867

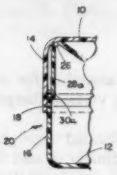
MATTRESS HAVING AN INTERNAL FLUID CONTAINING CHAMBER

Raymond M. Phillips, 305 Poquito Lane, Topanga, Calif. 90290

Continuation-in-part of Ser. No. 581,262, May 27, 1975, Pat. No. 4,006,501. This application Oct. 17, 1975, Ser. No. 623,445

Int. Cl.[2] A47C *27/08*

U.S. Cl. 5—371 **34 Claims**



1. A liquid containing mattress for supporting an individual in an inclined position comprising:

a. an upper sheet having a peripheral end margin,

b. a lower sheet having a peripheral end margin and being in spaced apart relationship to said upper sheet,

c. a first peripheral inner wall extending between and secured in operative relationship to said upper and lower sheets and forming a liquid chamber between said inner wall and upper and lower sheets,

d. said inner wall being tapered so that it extends in proximate relationship to the peripheral end margin of said upper sheet to form said liquid chamber substantially continuous with the surface of said upper sheet, said inner wall extending inwardly from the peripheral end margin of said lower sheet and being secured to said lower sheet inwardly of its peripheral end margin,

e. and a second peripheral outer wall extending between said upper and lower sheets forming a material containing chamber bounded by said outer and said inner wall and said lower sheet, and

f. said inner wall having a section slightly disposed inwardly from said outer wall to form a relatively thin liquid space therebetween and said section being secured relative to said outer wall and said lower wall so that said liquid chamber is in fluid communication with and includes said relatively thin liquid space.

4,055,868

DYEING METHOD

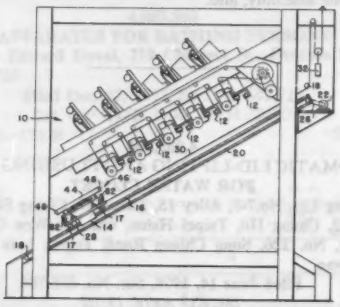
John H. O'Neill, Jr., Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 29, 1976, Ser. No. 745,658

Int. Cl.[2] D06B *1/02, 11/00*

U.S. Cl. 8—150 **1 Claim**

1. A method to dye a textile product comprising the steps: passing the textile product under a dye jet gun bar having a plurality of dye emitting orifices and a horizontal axis, applying a narrow pattern of dye on the textile product from the dye emitting orifices, indexing the textile product in a direction parallel to the horizontal axis of the gun bar, passing the textile product again under the dye emitting orifices to apply a second narrow pattern of dye on the textile product adjacent the first



applied pattern of dye and removing the textile product from under the dye jet gun bar.

4,055,869

CLAMPING AND CUTTING APPARATUS

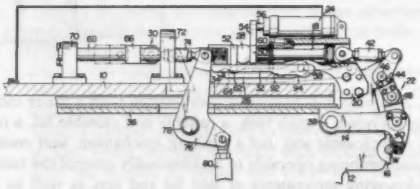
Takashi Furuto, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 17, 1976, Ser. No. 751,728

Claims priority, application Japan, Dec. 17, 1975, 50-169277[U]; Dec. 17, 1975, 50-169278[U]

Int. Cl.[2] B21D *43/10*; B21K *1/46*

U.S. Cl. 10—25 **7 Claims**



1. In clamping and cutting apparatus of the type incorporated with a header or the like, the combination of:

frame means;

a carriage having cutter means thereon and movable between a cutting position and a transfer position relative to said frame means;

a clamp lever pivotally mounted on said carriage for clamping work against said cutter means;

support means on said carriage;

a slider supported by said support means and operatively connected to said clamp lever, said slider being slidable relative to said support means between a clamping position for causing said clamp lever to clamp the work against said cutter means and an unclamping position for causing said clamp lever to release the work;

actuator means on said support means tending to move said slider from said clamping to said unclamping position;

a locking member mounted on said support means for pivotal movement between a locking position for locking said slider in said clamping position and an unlocking position for permitting said slider to be moved from said clamping to said unclamping position by said actuator means;

spring means yieldably urging said locking member from said unlocking to said locking position;

resilient means adapted to be compressed when said slider is locked in said clamping position by said locking member for exerting a reactive force on said slider, whereby said

slider is urged to move further in such a direction that said clamp lever clamps the work more positively;

reciprocating means mounted on said frame means for movement toward and away from said support means, whereby upon movement of said reciprocating means toward said support means while said carriage is in said cutting position said slider is moved to and locked in said clamping position against the forces of said actuator means and said resilient means;

cam follower means on said locking member; and

cam means carried by said reciprocating means and adapted to move said locking member from said locking to said unlocking position via said cam follower means against the force of said spring means upon movement of said reciprocating means away from said support means while said carriage is in said transfer position.

4,055,870

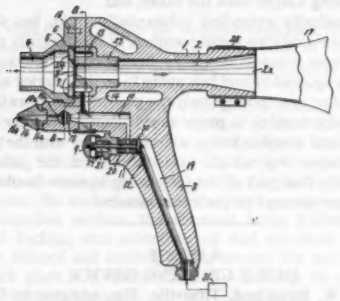
HAND-OPERATED APPARATUS FOR PNEUMATICALLY REMOVING DUST

Yasuzi Furutsutsumi, 1-19, 2-chome, Midoridi, Kawanishi, Hyougo, Japan

Continuation of Ser. No. 535,554, Dec. 23, 1974, abandoned. This application June 21, 1976, Ser. No. 698,148

Int. Cl.[2] A47L 5/16

U.S. Cl. 15—409 **2 Claims**



1. A hand operated apparatus connected to an air source for pneumatically removing dust, said apparatus comprising:

handle means for holding said apparatus, said handle means having a first air passage therethrough connected to said air source;

cylindrical main body means having a second air passage longitudinally therethrough with an inlet and a discharge end for receiving and discharging dust particles therethrough, said main body means comprised of:

a cylindrical main body portion having said second air passage longitudinally therethrough, and

an intake portion removably secured to the inlet end of said main body portion;

annular member means fitted within said cylindrical body means in said second air passage and connected to said first air passage for ejecting the air flowing from said air source through said first passage into said secondary passage toward the discharge end thereof, said annular member means comprised of:

an annular member positioned within said second air passage between said intake portion and said main body portion, said annular member having a first central opening therethrough aligned with said second air passage, the forward end of said first central opening having an inwardly tapered surface, and said annulr member further having an annular chamber spaced from and surrounding said first central opening, said annular chamber being open at the front portion thereof toward the front of said annular member and connected to said first air passage,

a ring plate adjacent said annular member between the outer circumference of said annular member and said annular chamber,

a ring holder next to said ring plate on the side thereof opposite said annular member having a second central opening therethrough aligned with said first central opening through said annular member and having a slanted surface extending circumferentially inwardly toward said central openings, whereby an annular slit is formed between said ring holder and said annular member due to the presence of said ring plate thereinbetween, and whereby air in said annular chamber is forced outwardly through said annular slit and flows rearward along the tapered surface of said annulr member through said first central opening toward the discharge end of said main body portion;

manually operable first control valve means in said first air passage for regulating the flow of air through said first air passage from said air source;

nozzle means connected to said handle means and operatively connected to said first air passage for ejecting the air coming from said air source through said first air passage outward therethrough; and

second air valve means between said first control valve means and said nozzle means for controlling the flow of air from said first air passage to said nozzle means.

4,055,871

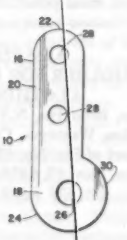
SILENCER DEVICE

John T. Morton, 15-2nd St., c/o P.O. Box 231, Scotstown, Quebec, Canada (J0B 3B0)

Filed Sept. 8, 1976, Ser. No. 721,392

Int. Cl.[2] E05D 13/00, 15/00

U.S. Cl. 16—86 A **4 Claims**



1. A silencer device for prevention of slamming of a door, which comprises a P-shaped element having a head portion and a tail portion, a bottom end of said tail portion being curved, said tail portion having a plurality of longitudinally aligned apertures therethrough; a upper left hand corner of said P-shaped element being curved, said tail portion of said P-shaped element adapted to be removably mounted on a vertical door jamb of a door frame by screw means extending through said aperture into said door jamb, said head portion of said P-shaped element extending forwardly of a forward edge of said door jamb and adapted to receive said door thereupon.

4,055,872

APPARATUS FOR TENDERIZING MEAT

Richard C. Wagner, Frankfort, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

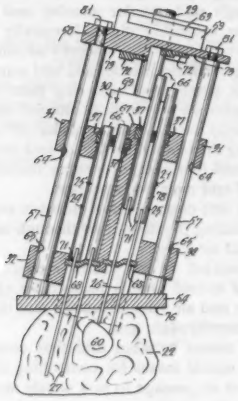
Filed July 6, 1976, Ser. No. 702,932

Int. Cl.[2] A22C 9/00

U.S. Cl. 17—25 **19 Claims**

1. Apparatus for tenderizing meat, comprising: a conveyor for conveying meat in a longitudinal direction through said apparatus; a mounting member above and transverse to said

conveyor; a plurality of knives comprising elongated blades on said mounting member having sharp meat penetrating and severing blade ends adjacent to said conveyor, each said blade end being transversely planar and arranged at an angle other than 0° to said direction of movement of said conveyor; means for arranging said blades in a plurality of spaced first rows extending longitudinally of said direction of movement and a



plurality of spaced second rows extending transversely to said direction of movement, the collective said blades in said plurality of second rows include some blade ends in some combinations of said second rows parallel to each other and other blade ends in other combinations of said second rows at an acute angle to each other; and means for reciprocating said mounting member toward and away from said meat and thereby said knives into and from meat penetration.

4,055,873

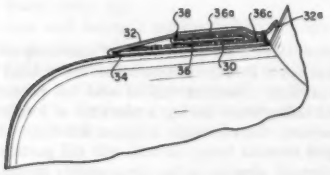
ACCESSORY HOLDER FOR USE ON ARTICLE OF CLOTHING

Robert A. Kallman, Brooklyn, N.Y., assignor to Kallman Research Corporation, Weatogue, Conn.

Continuation-in-part of Ser. No. 690,262, May 26, 1976. This application Nov. 17, 1976, Ser. No. 742,617

Int. Cl.[2] A44B *21/00*

U.S. Cl. 24—3 C **4 Claims**



1. An accessory holder for an article of clothing comprising a flap member for covering a part of the clothing article, means for fixedly securing one end of said flap member at a first point on said article, a first elongated piece of fabric fastening material with fastening means thereon secured to the clothing article in at least a part of the area to be covered by the free part of the flap, a second piece of fabric fastening material with fastening means thereon on the underside of the flap having a first part secured to the underside of the flap and a second part hanging free, fastening means of both parts of said second piece of fabric fastening material facing the clothing article and engaging the fastening means on the first piece of fabric fastening material when the flap is laid down on the clothing article with the accessory being held located between the underside of the flap and second part of the second piece of fabric fastening material.

4,055,874

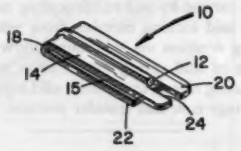
COMBINATION PLASTIC AND METAL PAPER CLIP

Dwight C. Brown, 1516 N. Nicholas St., Arlington, Va. 22205

Filed Mar. 24, 1976, Ser. No. 670,065

Int. Cl.[2] B42F *1/00*; A44B *21/00*

U.S. Cl. 24—67.3 **12 Claims**



1. A paper clip for clampingly engaging at least two sheets of paper, said paper clip comprising:

a body member, substantially U-shaped in longitudinal cross-section, of semi-rigid, generally flexible plastic sheet material, said body member having a pair of legs presenting two substantially planar interior surfaces between which at least two sheets of paper may be clamped, one of said legs being longer than the other; and

a longitudinally extending substantially rigid, but slightly flexible rigidifying metal member, of substantially smaller transverse cross-section than that of the body member, fixedly secured to said legs away from the interior surfaces thereof so as to present only the planar interior surfaces of the body member to paper sheets clamped therebetween, said metal member being not coextensive with the part of the longer leg which extends beyond the other leg whereby that part of the longer leg is more flexible than any part secured to the metal member.

4,055,875

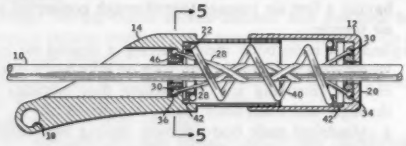
CABLE GRIPPING DEVICE

Frederick W. Strickland, Titusville, Fla., assignor to General Dynamics Corporation, San Diego, Calif.

Filed May 24, 1976, Ser. No. 689,715

Int. Cl.[2] F16G *11/01*

U.S. Cl. 24—115 R **3 Claims**



1. A fail-safe cable gripping device comprising:

a first cup-shaped housing having a generally cylindrical wall and a transverse base, said base having a central aperture adapted to having a cable extend therethrough along the axis of said first housing;

a second cup-shaped housing having a generally cylindrical wall and a transverse base, said base having a central aperture adapted to having a cable extend therethrough along the axis of said second housing;

the open end of said second housing extending in a telescoping relationship into the open end of said first housing;

a gripper member comprising at least one strand secured to the inside of the bases of said first and second housings and adapted to coil around a cable extending through said housings;

a compression spring within said housing bearing against the

inside of the bases of said housings to bias the housings apart and tighten said gripper against a cable extending through said housings;

said first and second housings being adapted to straight-line manual movement toward each other whereby said gripper is released and said device may be moved along a cable extending therethrough, and adapted immediately and automatically to return to the gripping position in response to said spring when said housings are released.

4,055,876

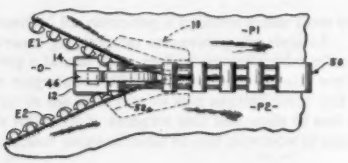
SLIDER FOR INVISIBLE-TYPE SLIDE FASTENER

Walter Thomas Ackermann, Watertown, and Jeremias Anthony Martins, Wolcott, both of Conn., assignors to Scovill Manufacturing Company, Waterbury, Conn.

Filed June 7, 1976, Ser. No. 693,422

Int. Cl.[2] A44B *19/30*

U.S. Cl. 24—205.14 R **13 Claims**



1. A slide fastener slider for invisible-type slide fasteners, the slider having a body comprising a back plate of flaring shape and with side arms, and a diamond, the diamond at least being formed of resilient plastic material, the lower end of the diamond being disposed against the central portion of the floor of the back plate, the lower surface of the diamond being formed with a socket element and the upper surface of the plate being formed with an integrally formed head element, the two elements being interengaged to hold the diamond on the back plate, the undersurface of the plate presenting a smooth projection-free surface, the diamond being formed with an integral locking arm extending up and out from the upper surface thereof and arching down toward the narrow end of the back plate and terminating in a locking tip adapted to engage fastener elements.

4,055,877

METHOD OF MANUFACTURING A CATHODE RAY TUBE

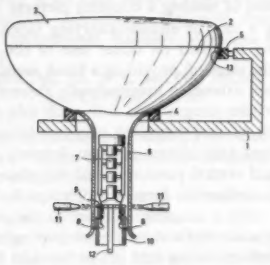
Peter Hermans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,958

Claims priority, application Netherlands, Mar. 18, 1975, 7503177

Int. Cl.[2] H01J *9/18*

U.S. Cl. 29—25.16 **2 Claims**



1. A method of manufacturing a cathode ray tube having a tubular neck of a lead-containing glass, including the steps of closing said tube by a glass base plate having sealed therein a number of contact pins which are arranged in a circle and on which base plate an electrode system for generating at least two electron beams is mounted, and sealing the periphery of said base plate to the wall of said neck by heating while supporting said base plate in a position accurately referred to a predetermined reference system of axes by a supporting member, said supporting member having guide holes and reference holes positioned with respect to said contact pins to determine the rotational position of the electrode system about its longitudinal axis with respect to the reference system of axes, the improvement comprising the step of sealing the edge of said base plate to said wall of said tube neck with said reference holes spaced from said base plate, thereby inhibiting deposition of lead released from said lead containing glass onto the walls of said reference holes.

4,055,878

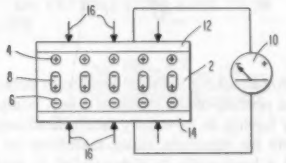
STABILIZATION OF PIEZOELECTRIC RESIN ELEMENTS

Peter Francis Radice, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sept. 24, 1976, Ser. No. 726,381

Int. Cl.[2] H01L *41/22*

U.S. Cl. 29—25.35 **16 Claims**



1. A method of stabilizing a poled piezoelectric resin element comprising applying pressure in excess of 20 p.s.i. to said element while its surfaces are electrically short circuited, said pressure being applied in an amount and for a time sufficient to provide a stabilized piezoelectric element.

4,055,879

ROLLER

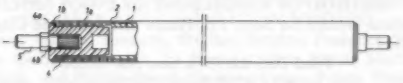
Siegfried Schneider, Durrnhaar; Kurt Thate, Munich; Erwin Geyken, Munich; Horst Kempe, Munich, and Stephan Macher, Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Division of Ser. No. 446,923, Feb. 28, 1974, Pat. No. 3,919,754, which is a division of Ser. No. 375,850, July 2, 1973, Pat. No. 3,823,456. This application May 25, 1976, Ser. No. 689,856

Claims priority, application Germany, July 1, 1972, 2232424

Int. Cl.[2] B21B *31/08*

U.S. Cl. 29—123 **8 Claims**



1. A roller, particularly for use in apparatus for wet treatment of strip or sheet material with aggressive fluids, comprising an elongated metallic core having two spaced end portions and an outer surface; a cylindrical coat of chemically resistant thermoplastic material immediately adjacent to said outer surface and having end openings adjacent said end portions of said core; and two side elements of synthetic plastic material fully overlapping said end openings of said coat and having portions received in said end portions of said core, said side

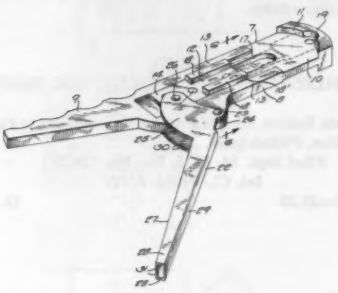
elements having coupling means coaxial with said core and being sealingly bonded with said coat so that said side elements and said coat together form a closed fluid tight and corrosion-resistant envelope of synthetic plastic material around said metallic core to protect the same from attack by said aggressive fluids.

4,055,880

KEY ASSEMBLY TOOL

Frank G. Moessner, Pointe Claire, Canada, assignor to Unican Security Systems, Ltd., Montreal, Canada

Filed Sept. 27, 1976, Ser. No. 726,998
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—267 **14 Claims**



1. A tool for attaching a slotted head to or detaching it from the head end portion of the shank of a key, comprising:

A. a body having an upwardly facing head-supporting surface with an abutment rising therefrom to receive and support a head with its slot parallel to said supporting surface and perpendicular to said abutment;

B. a carriage slidably mounted on the body, said carriage having a longitudinal axis, an upwardly facing key shank supporting surface and a front end facing said abutment;

C. means constraining the carriage to linear advance along a path parallel to its longitudinal axis towards and retraction from said abutment;

D. key shank engaging means on said carriage by which the shank of a key laid on its upwardly facing surface is held and positioned on the carriage with its head end portion protruding beyond the front end of the carriage in line with the slot of a head in position on the upwardly facing head-supporting surface of the body in front of said abutment, so that as the key shank is advanced by the carriage its protruding head end portion is driven into the slotted head; and

E. manually operable motion-producing means reacting between the body and the carriage for advancing and retracting the carriage.

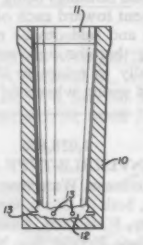
4,055,881

METHOD OF REBUILDING AN INGOT MOLD

Micheal Donald La Bate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Dec. 22, 1976, Ser. No. 753,314
Int. Cl.[2] B23K *23/00*; B22D *19/10*
U.S. Cl. 29—401 A **7 Claims**

1. The method of rebuilding an ingot mold having an eroded area in the cavity thereof, said cavity having a known original configuration and comprising the steps of cleaning said eroded area, placing a metal producing exothermic compound in said eroded area and igniting said compound so as to produce a molten mass in said eroded area and containing said molten mass in said eroded area so as to reshape said cavity in said mold in accordance with its known original configuration, said metal producing exothermic compound comprising metallic aluminum, wollastonite, ferro silicon, manganese dioxide, fine iron scale and graphite, the fine iron scale an metallic aluminum being present in quantites sufficient to form thermite capable of melting the compound.

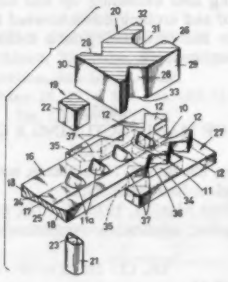


4,055,882

METHOD OF MAKING A COUPLING ELEMENT FOR A SLIDE FASTENER

Hiroshi Yoshida, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 660,915, Feb. 24, 1976, Pat. No. 4,010,520. This application Oct. 8, 1976, Ser. No. 730,865
Claims priority, application Japan, Feb. 27, 1975, 50-27315; Mar. 6, 1975, 50-27764
Int. Cl.[2] B21D *53/52*
U.S. Cl. 29—410 **1 Claim**



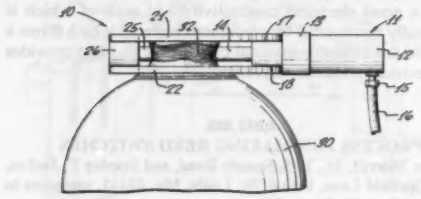
1. A method of making a coupling element for a slide fastener having a pair of element-carrying tapes, the coupling element being mounted on either one of the pair of tapes, comprising the steps of: providing a blank metal web having a central portion extending longitudinally thereof and a pair of marginal portions integral one with each side of said central portion, each of said marginal portions being transversely tapered toward said central portion; drawing a limited area portion of said central portion out of the plane thereof away from its one surface to form a projection for intercoupling engagement with a coupling element on the other tape; and stamping out said metal web to form a coupling element having a head portion including said projection and formed of said central portion and a pair of tape edge clamping legs each integral with said head portion and formed of one of said pair of marginal portion.

4,055,883

METHOD AND APPARATUS FOR REMOVING COLLARS FROM COMPRESSED GAS CYLINDERS

Carl A. Grenci, 4791 Lesa Place, Yorba Linda, Calif. 92686

Filed July 26, 1976, Ser. No. 708,998
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—427 6 Claims



1. A method for removing a cylinder collar from the top of a compressed gas cylinder comprising the steps of:

applying a lateral force an first opposite sides of said collar of a magnitude sufficient to collapse the side walls of said collar in the direction of said applied force and over an area sufficient to elongate said side walls of said collar in a direction perpendicular to said direction of said applied force;

repeating the above-mentioned step on second opposite sides of said collar displaced by approximately 90° from said first sides, said second step freeing said collar from said cylinder neck; and

removing said collar from said cylinder neck.

4. Apparatus for removing a cylinder collar from the top of a compressed gas cylinder consisting of:

a housing and a first driven ram extendable axially from one end of said housing;

ring-shaped support means connectable to said one end of said housing; and

a second ram fixedly connected to said support means in facing, spaced, coaxial relationship to said first ram, said first ram being capable of being driven towards said second ram with a force sufficient to collapse said collar in the direction of the applied force, the areas of the facing ends of said rams being great enough to prevent penetration of said rams into said collar, the shapes of said rams being such as to elongate said collar in a direction perpendicular to said direction of said applied force, said apparatus including only said first and second rams, there being no additional rams connected to said support means to prevent elongation of said collar in said direction perpendicular to said direction of said applied force.

4,055,884

FABRICATION OF POWER FIELD EFFECT TRANSISTORS AND THE RESULTING STRUCTURES

Chakrapani Gajanan Jambotkar, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,053
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 11 Claims

1. Method for fabrication of MOSFET devices having high current and high voltage characteristics comprising:

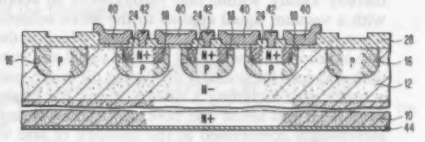
providing an N substrate;

forming a plurality of P regions in said substrate;

forming N regions in said P regions;

forming precise and desired gate insulator regions above peripheries of inner said P regions while allowing outermost annular P regions to remain under a blanket fieled insulator;

forming source contacts to the N regions within said inner P regions, forming gates over the said gate insulator regions, and forming the common drain region contact on the backside of the N+ substrate; and



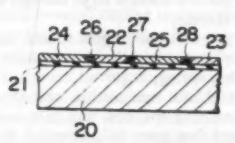
allowing the said outermost annular P regions to remain unbiased to thereby improve the drain-to-substrate reverse breakdown voltage.

4,055,885

CHARGE TRANSFER SEMICONDUCTOR DEVICE WITH ELECTRODES SEPARATED BY OXIDE REGION THEREBETWEEN AND METHOD FOR FABRICATING THE SAME

Iwao Takemoto, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Division of Ser. No. 446,805, Feb. 28, 1974, abandoned. This application Sept. 10, 1976, Ser. No. 722,111
Claims priority, application Japan, Feb. 28, 1973, 48-23161; June 27, 1973, 48-71713
Int. Cl.[2] B01J *17/00*; H01L *29/58*
U.S. Cl. 29—578 19 Claims



1. A method of manufacturing a charge transfer semiconductor device comprising the steps of:

a. forming a first insulating layer on a first surface of a semiconductor body;

b. forming a first conductive layer on said first insulating layer;

c. forming a masking layer on said first conductive layer;

d. selectively removing portions of said first conductive layer and said masking layer, to expose a plurality of surface portions of said first insulating layer and side surfaces of said first conductive layer;

e. replacing selected portions of said first conductive layer disposed beneath peripheral portions of said masking layer with a second insulating layer; and

f. selectively forming a second conductive layer on said plurality of exposed surface portions of said first insulating layer.

4,055,886

VARIABLE INDUCTANCE TRANSDUCER COMBINED ASSEMBLY AND CALIBRATION METHOD

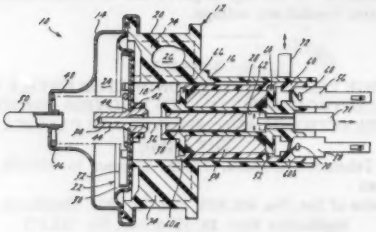
Lawrence William Tomczak, Sterling Heights; Frederick William Crall, Farmington; La Verne Andrew Caron, Sterling Heights, and Walter Joseph Campau, Grosse Pointe Woods, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 628,289, Nov. 3, 1975, Pat. No. 4,024,484. This application Dec. 13, 1976, Ser. No. 749,944
Int. Cl.[2] H01F *41/00*
U.S. Cl. 29—593 2 Claims

1. The method of making a variable inductance vacuum transducer for accurate combined assembly and calibration to obtain a desired inductance vs. vacuum characteristic thereof, said method comprising:

providing a housing containing an axial throughbore, a

vacuum servo actuator at one axial end of said throughbore, and a core disposed within said throughbore and connected with said servo actuator for positioning thereby axially within said throughbore in accordance with a vacuum signal applied to the servo actuator, said servo actuator including a diaphragm which is displaceable in accordance with said vacuum signal and connected with said core for similarly displacing the latter, said servo actuator also including a biasing spring for biasing said diaphragm and hence said core, said biasing spring being increasingly compressed as the intensity of said vacuum signal increases;



providing an inductance coil unit capable of being disposed within said throughbore and having an axial bore passing through the coil thereof large enough to permit said core to move therein;

applying a given vacuum signal to said vacuum servo actuator to displace said diaphragm and core and also compress said biasing spring;

disposing said coil unit within said throughbore by first axially inserting the coil unit into said other axial end thereof and then more fully inserting the coil unit into said throughbore so that said core passes into said bore to a position which produces a desired inductance of said coil unit for the given vacuum signal applied to the servo actuator.

4,055,887

METHOD FOR PRODUCING A STABILIZED ELECTRICAL SUPERCONDUCTOR

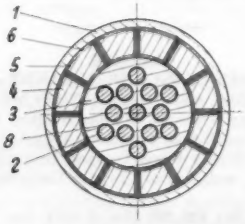
Gundolf Meyer, Birmenstorf, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Feb. 18, 1976, Ser. No. 654,897

Claims priority, application Switzerland, Mar. 26, 1975, 3865/75

Int. Cl.[2] H01V *11/00*

U.S. Cl. 29—599 **8 Claims**



1. A method for producing a stabilized super-conductor containing a plurality of thin filaments of super-conductive material, in which a composite parent slug is mechanically worked to achieve metallurgical bonding between all of the individual components of the slug followed by annealing to effect formation of super-conductive filaments by diffusion of at least one diffusible material component contained in a matrix material included in the slug into a second material component disposed in filament form in the interior of the conductor, characterized in that a middle region of the cross-section of the slug is constituted by a plurality of rods or wires consisting of the material component which forms the second, super-conductive material and a surrounding material containing the diffusible material component, and said middle region is surrounded by a contiguous ring of rods or wires of a material having a good electrical conductivity and each of which is individually surrounded by contiguous material which forms a barrier to the diffusible material component and also provides high electrical resistance therebetween.

4,055,888

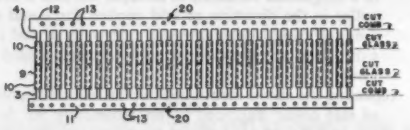
PROCESS FOR MAKING REED SWITCHES

Vaughan Morrill, Jr., 26 S. Spoede Road, and Stanley F. Jackes, 12 Muirfield Lane, both of St. Louis, Mo. 63141, assignors to Morex, Inc., St. Louis, Mo.

Filed Oct. 4, 1976, Ser. No. 729,005

Int. Cl.[2] H01H *11/00*

U.S. Cl. 29—622 **9 Claims**



1. The process of making reed switches comprising forming combs each including a header web and, integral with said web and projecting therefrom, a plurality of reed elements, said reed elements being parallel with one another and spaced from one another along said web; forming a plurality of elongated glass envelope tubes, each with two, opposite, open ends; mounting said plurality of glass tubes parallel with one another and spaced the same centerline-to-centerline distance as said reed elements, in a fixture; inserting reed elements of a first comb into one end of said tubes and inserting reed elements of a second comb into the other end of said tubes, until the inner ends of said opposite reeds are in the desired lengthwise positions with respect to one another and forcing the reed elements of said first comb at their free inner end against the inner wall of said tubes in one direction, so that each said reed element exerts a positive pressure against said tube wall and forcing the reed elements of said second comb at their free inner end against the inner wall of the tubes in the opposite direction from the said reed elements of said first comb, so that each said reed element exerts a positive pressure against said tube wall; while maintaining said relative positions and positive pressures, heating selected sealing areas of said tubes and fusing said reed elements into said tubes, to form sealed envelopes, in an area outboard of said inner end of said reed elements, and cooling the sealing areas of said envelopes, freezing said reed elements in said relative positions and with said positive pressures, and thereafter separating said reed elements from said webs.

4,055,889

CONNECTOR HARNESS ASSEMBLY MACHINE

Vito A. Fusco, Palos Hills; Joseph C. Bennett, Lisle; Jack F. Funcik, Downers Grove; Kenneth L. Kufner, Hickory Hills, and Thomas E. Schneider, Burbank, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Feb. 18, 1976, Ser. No. 659,004

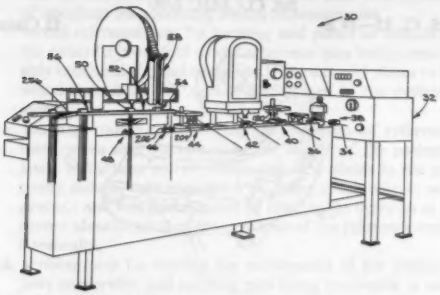
Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—710 **10 Claims**

1. In a connector harness assembly machine including a harness fabrication assembly with an insertion station for automatically inserting a plurality of terminated wire leads, one at a time, into a plurality of corresponding terminal receiving

cavities formed in a connector housing held at said insertion station, the improvement comprising:

probe means associated with the harness fabrication assembly and movable into engagement with a terminal in a terminal cavity at the insertion station for sensing whether



a terminated lead has been fully inserted into the corresponding terminal receiving cavity, each terminal receiving cavity including two openings, said probe means including two electrical elements each adapted to be inserted into one of the cavity openings for engagement with the terminal.

4,055,890

GRASS TRIMMING DEVICE

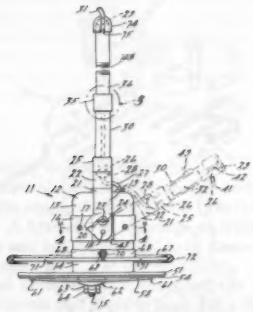
Paul F. Seibold, 1760 N. Woodward, Bloomfield Hills, Mich. 48013

Filed June 17, 1976, Ser. No. 697,048

The portion of the term of this patent subsequent to July 26, 1994, has been disclaimed.

Int. Cl.² B26B *15/00*; A01D *55/18*

U.S. Cl. 30—240 **15 Claims**



1. In a grass trimming device, a shaft, a motor for driving said shaft, a circular plate having a central opening and radially disposed cutting teeth throughout the outer circumferential edge with a notch provided ahead of each tooth, said plate being disposed in fixed relation relative to said motor with said shaft extending through said opening, a cutting blade of narrow width having a length substantially equal to the diameter of said plate, said blade having a central aperture through which said shaft extends and secured in driving relation therewith with the cutting edges offset but in parallel relation with the centerline of the blade which is aligned with the center of the shaft, said blade cutting edges being in scissors relation with said radially disposed cutting edges, and a handle attached to said assembly and extending outwardly substantially normal to said plate to permit the motor and plate to be moved by said handle in any direction with no more than half of said teeth engaging the grass to be cut at any one time as one end of the cutting blade advances to cut the grass in a notch at one tooth only at any one time with a scissors cutting action to thereby substantially reduce the power required to operate the blade of the trimming device.

4,055,891

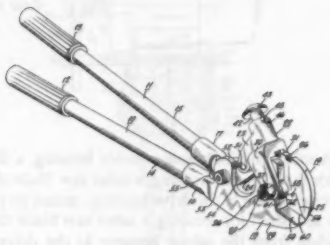
RATCHET-OPERATED CABLE CUTTER

John R. Wick, 1040 Old Welsh Road, Huntingdon Valley, Pa. 19006

Filed May 24, 1976, Ser. No. 689,196

Int. Cl.² B26B *13/26*

U.S. Cl. 30—250 **9 Claims**



1. A two-handle-actuated cutting tool of the shear type having two oppositely-beveled cutting jaw members journaled on a common main pivot, and adapted to be opened and closed in shearing relationship, one of said jaw members being provided with a wheel segment having an arcuate ratchet portion circumferentially aligned with the axis of the main pivot; a bracket member comprising a saddle part and a pair of legs extending therefrom, said legs straddling both of said jaw members and being journaled on the main pivot and said saddle part housing a single, reversible driving pawl which operates said ratchet selectively to open or to close said jaws.

4,055,892

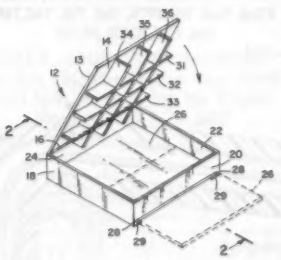
FOOD DICER

Joseph Del Vecchio, 3206 Middletown Road, Bronx, N.Y. 10465

Filed Mar. 10, 1976, Ser. No. 665,693

Int. Cl.² B26B *3/00*

U.S. Cl. 30—303 **4 Claims**



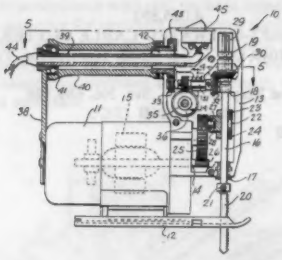
1. A food dicer which may be used for jello and the like comprising a body to which is hingedly attached a cover provided with a plurality of cutting blades suitably arranged in the desired cutting pattern, the body comprised of several joined side walls to which is slidably fitted a remobable bottom; so that when the item to be cut is placed on the bottom within the body and the cover is swung towards the bottom — the item becomes cut; and so that the cut small items can be released as the bottom is slidably removed.

4,055,893

SABER SAW CONTROL HANDLE

Leo C. Saxe, 10907 Annapolis Rd., Bowie, Md. 20716

Filed Apr. 16, 1976, Ser. No. 677,533
Int. Cl.[2] B27B *11/00, 19/09*
U.S. Cl. 30—392 2 Claims



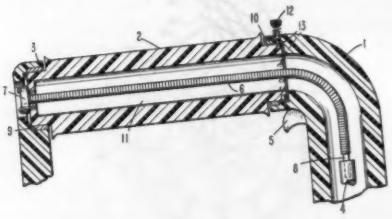
1. A saber saw including a motor housing, a drive housing, a motor in the motor housing, a saber saw blade shaft mounted for reciprocation in the drive housing, means on the lower end of the saw shaft for securing a saber saw blade thereto, means extending from the motor housing to the drive housing for vertically reciprocating the saw shaft and saber saw blade secured thereto, said last mentioned means comprising a spur gear rotated by the gear on the end of the shaft of the motor, the spur gear causing a single eccentric drive pin mated therewith to impart vertical reciprocal motion to the saw shaft through a bushing and a coupling, a handle having its axis substantially parallel to the work surface and substantially perpendicular to the axis of reciprocation of the saw shaft, a transverse shaft extending through said drive housing, and means in the drive housing for linking both said handle and said transverse shaft to the reciprocating saber saw shaft to rotate the saw shaft upon rotation of said handle or said transverse shaft or both.

4,055,894

SABER AND RECIPROCATING SAW BLADE TURNING CONTROL ARRANGEMENT

Leo C. Saxe, 10907 Annapolis Road, Bowie, Md. 20716

Filed Nov. 18, 1976, Ser. No. 742,748
Int. Cl.[2] B27B *19/09*
U.S. Cl. 30—394 7 Claims



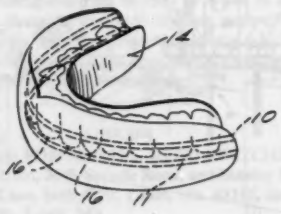
1. In portable power tools of the type having a reciprocating shaft mounted within a housing to which a saw blade etc., is attached, means to rotate the said reciprocating shaft about its axis of reciprocation by means of a full-hand grip rotatable manipulating handle for the tool and rotatable flexible cable means connected between said shaft and said handle for rotating said shaft.

4,055,895

INTRA-ORAL TOOTH POSITIONER AND PROCESS FOR PRODUCTION THEREOF

Gerald W. Huge, Racine, Wis., assignor to Professional Positioners, Inc., Racine, Wis.

Filed Mar. 29, 1976, Ser. No. 671,876
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 B 12 Claims



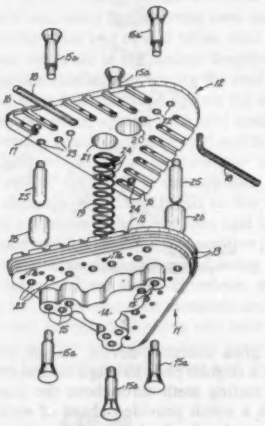
1. Tooth positioner means comprising an unstressed arch-shaped body of resilient material formed to fit within a patient's mouth between the upper and lower arches, such means having a generally concave surface bearing on the buccal and labial surfaces of the teeth of at least one arch and having a convex surface adjacent to the lingual surface of the teeth of said arch, and such means having at least one prestressed elastic band which exerts lingual force on the buccal and labial surfaces of the teeth of at least one arch when the tooth positioner is worn.

4,055,896

OCCLUSAL PROGRAMMING UNIT

Andrew Neville Corbett, 345 Stirling Highway, Claremont, Australia (6010)

Filed Apr. 6, 1976, Ser. No. 674,092
Int. Cl.[2] A61C *9/00*
U.S. Cl. 32—19 5 Claims



1. An occlusal programming unit for the intraoral recording of jaw movements comprising:

a. a pair of generally triangular plates of rigid synthetic resin adapted to be positioned adjacent the upper and lower jaws of a patient's mouth during intraoral recording of the patient's jaw movements, each of said plates having a periphery of sufficient dimensions to permit peripheral trimming thereof to the shape of and dimensions of the patient's dental arches, and each of said plates having a first surface adapted to face towards the other plate intraorally and a second surface adapted to face away from

the other plate intraorally, each of said first surfaces being provided with a series of grooves extending inwardly from the periphery of the respective plate for receiving locating rods, a series of holes for receiving scribing pins, and a pair of sockets for receiving an end of a spring, and each of said second surfaces being provided with a series of openings for receiving model reference pins;

b. model reference pins for locating said plates on models of the patient's jaws, said model reference pins being removably receivable in said openings, to permit said plates to be withdrawn from the models and placed in the patient's mouth;

c. locating rods for identifying the positions of reference teeth when said plates are on the model of the patient's jaws, to thereby aid in positioning said plates in the patient's mouth, said locating rods being receivable in said grooves and being adapted to be fixed in the latter so as to permit identification of the positions of the reference teeth intraorally;

d. scribing pins for tracing the movements of the patient's jaws intraorally, said scribing pins being receivable in said holes and being dimensioned so as to project outwardly of said holes in said plates towards the respective other plate; and

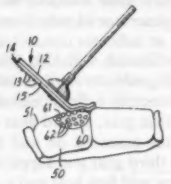
e. a spring for holding said plates apart intraorally, said spring having a pair of spaced ends each of which is received in a socket of a different one of said plates intraorally.

4,055,897

DENTAL ABRADING DEVICE AND METHOD

Charles J. Brix, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 11, 1976, Ser. No. 665,921
Int. Cl.[2] A61G *3/06*; B24B *1/00*; B24D *9/08*
U.S. Cl. 32—59 **13 Claims**



1. An abrading device comprising:

a conformable elastomeric disc-shaped body having a thickness in the range of from about 0.15 to 0.4 millimeters and a Shore A hardness in the range of from about 50 to 75; wherein said body is adapted to be connected to a driving means; and

an exposed abrasive layer supported on said elastomeric body; wherein said abrasive layer has a thickness less than about 0.3 millimeters and wherein the diameter of said abrasive layer is from about 1 to 1.1 times the diameter of said elastomeric disc-shaped body.

4,055,898

MEANS FOR FACILITATING CHECKING AND REPLENISHMENT OF CRANKCASE OIL IN A SMALL ENGINE

Daniel E. Braun, Brookfield, and Patrick J. Bruener, West Allis, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed May 13, 1976, Ser. No. 686,146
Int. Cl.[2] G01F *23/04*
U.S. Cl. 33—126.4 R **11 Claims**

1. A device for indicating whether oil in the crankcase of an engine is above or below a predetermined level, said device being of the type that comprises a tube having a lower end normally in the crankcase at said level and having an upper end communicated with a suction chamber that provides for withdrawal of a small quantity of oil out of the crankcase (if oil therein is above said level) and to a location at which the withdrawn oil is visible, said device being characterized by:

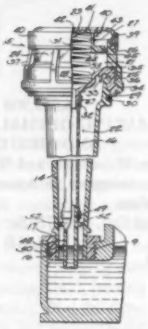
A. said suction chamber being defined by means comprising

1. a bottom wall to which the upper end portion of said tube is attached and through which the interior of the tube is communicated with the interior of the suction chamber,

2. a substantially annular side wall having a bottom portion sealingly connected with said bottom wall, and

3. a flatwise upwardly and downwardly displaceable top wall which is sealingly connected with an upper portion of said side wall;

B. said side wall



1. being at least in part transparent between its connections with said bottom wall and said top wall, and

2. having a cylindrical interior surface portion between said connections;

C. said top wall being yieldingly biased upwardly to a normal position from which it can be manually displaced downwardly;

D. a resilient circular wiper having an axially slidable wiping fit with said interior surface portion of the side wall; and

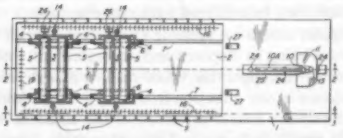
E. means providing a connection between said wiper and said top wall whereby said wiper is constrained to move up and down with said top wall so that manual downward displacement of the top wall causes the wiper to remove residual oil from said cylindrical interior surface portion.

4,055,899

AXLE ALIGNMENT MACHINE

Floyd E. Dean, Box 124, Morning Sun, Iowa 52640

Filed Mar. 30, 1976, Ser. No. 672,006
Int. Cl.[2] G01B *3/14, 5/25*
U.S. Cl. 33—193 **2 Claims**



1. An axle alignment machine comprised of a base having a forward portion and a rearward portion, a stand supporting a fifth wheel located on the forward portion of the base, a pit located in the rearward portion of the base, removable supports extending across the pit, tracks located in the pit, a plurality of carriages, each carriage having a frame, a plurality of track rollers and a plurality of wheel rollers turnably mounted on each frame, the track rollers being in movable engagement

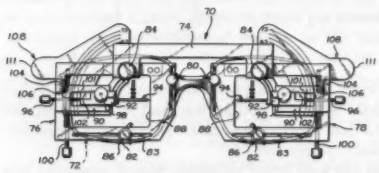
with the tracks, the wheel rollers being mounted on the carriages in fixed relation to the track rollers, markings in the pit along the tracks, plumb bobs attached to the carriages to read over the markings along the tracks, the wheel rollers being mounted in fixed relation to each other and the track rollers to support the wheels of a trailer fastened to the fifth wheel, additional markings across the rear of the pit, a rear plumb bob attached to the rear of the trailer to read over the additional markings across the rear of the pit, motors attached to the wheel rollers to turn the wheel rollers.

4,055,900

DEVICE FOR MAKING OPTHALMIC MEASUREMENTS AND METHOD

Bernard Grolman, Worcester, and William Richards, Medway, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Oct. 2, 1975, Ser. No. 619,083
Int. Cl.[2] A61B *3/10*
U.S. Cl. 33—200 **6 Claims**



1. Apparatus for applying ophthalmic measurements directly to a spectacle frame comprising:

a main supporting section including a pair of depending measuring plates;

means for detachably connecting said main supporting section and measuring plates to said spectacle frame with said plates disposed forwardly of lens rims of the frame;

a one-piece reticle having vertical and horizontal legs carried by each of said depending plates within the area circumscribed by right and left rims respectively of said spectacle frame and each disposed generally forwardly of one of right and left eyes of a patient wearing said frame and measuring apparatus, means for adjusting each one-piece reticle as a unit in directions horizontally and vertically relative to a selected point on a respectively adjacent eye and wherewith a point on at least one leg of said reticle may be centered with said eye; and

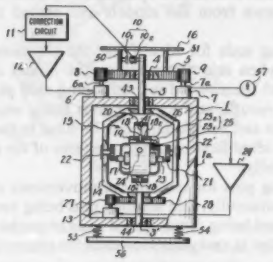
dual scale means on each of said plates, one of said scale means being so disposed and calibrated as to indicate to a user of the apparatus when read, a measurement of the distance in one direction from said point on said reticle to the extreme lateral extension of the adjacent lens rim of said spectacle frame and the other scale means being so disposed and calibrated as to similarly indicate a measurement of the distance from said point on said same reticle to the extreme inferior extension of said lens rim, said dual scale means being so constructed and arranged as to provide both of said measurements simultaneously and with a single setting of adjustment of said unitary reticle in each case of each right and left eye of said patient, visual perception of said scales being required to effect said readings.

4,055,901

GYROCOMPASS

Susumu Ishii, Tokyo, Japan, assignor to Kabushiki Kaisha Tokyo Keiki, Tokyo, Japan

Continuation-in-part of Ser. No. 474,252, May 29, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 649,996
Claims priority, application Japan, May 31, 1973, 48-61477
Int. Cl.[2] G01C *19/38*
U.S. Cl. 33—324 **4 Claims**



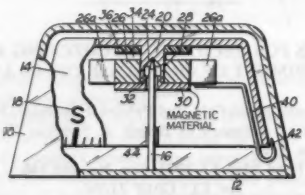
4. In a gyrocompass comprising a housing, a gyro case, a gimbal supporting the gyro case, a follow-up shaft, a follow-up ring rotatably supported by said housing to rotate about a vertical axis on said follow-up shaft, and said gimbal is mounted within the follow-up ring, a first follow-up system including detecting means mounted on the gimbal support and the gyro case to detect a relative movement therebetween about the vertical axis, the improvement comprising a second follow-up detecting means mounted to said housing and said follow-up shaft, wherein said second follow-up detecting means includes a first gear rotatably mounted on said follow-up shaft, a signal generator mounted on said housing and having a rotary shaft, an indicator connected to said signal generator, a second gear in mesh with said first gear, and said rotary shaft of said signal generator fixed to said second gear, a pick-up mounted for detecting a displacement between said follow-up shaft and said first gear, a third gear in mesh with said first gear, a servo motor mounted on said housing and its rotary shaft fixed to said third gear and supplied the output from said pick-up and driving said first gear and a compass card attached to said first gear.

4,055,902

COMPASS WITH MEANS FOR CORRECTING ANGLE OF MAGNETIC VARIATION

William S. Jolley, 7934 NE. Alberta St., Portland, Oreg. 97218, and William R. Cranford, 521 Gorgonia, Newport Beach, Calif. 92660

Filed Feb. 6, 1976, Ser. No. 655,845
Int. Cl.[2] G01C *17/38*
U.S. Cl. 33—356 **4 Claims**



1. A magnetic compass comprising

a. a housing,

b. a rotatable compass card having a top wall,

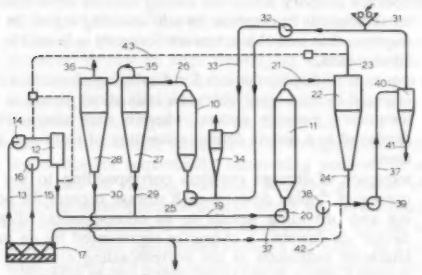
c. means in said housing rotatably supporting said compass card therein on substantially a vertical axis,
d. a projecting hub integral with said compass card,
e. a flange integral with said hub and spaced from said top wall,
f. said flange being formed of magnetically permeable material,
g. and a compass magnet rotatably mounted on said hub between said flange and said top wall of said compass card and being magnetically attracted to said flange for connecting said magnet to said compass card for unitary rotation,
h. said hub being longer than the thickness of said magnet whereby the latter can be moved out of engagement with said flange into engagement with said top wall and also rotatably adjusted relative to said compass card by an exterior magnet of sufficient magnetic power, whereby to correct the angle of magnetic variation by rotating said compass magnet by the exterior magnet and then removing the exterior magnet to permit said compass magnet to re-engage with said flange in the adjusted position,
i. the space between said flange and said top wall being pre-selected relative to the thickness of said magnet such that said flange when said magnet is moved into engagement with said top wall by the exterior magnet still is within the influence of said compass magnet.

4,055,903

METHOD AND APPARATUS FOR DRYING DISINTEGRATED FIBER MASS

Karl Erik Hansen, Kokkedal; Svend Hovmand, Horsholm; Mogens Lindskov Pedersen, Kokkedal; Christian Schwartzbach, Glostrup, all of Denmark; Myat Htun, Vallingby, Sweden; Alf de Ruvo, Stockholm, Sweden, and Sören Cavlin, Saffle, Sweden, assignors to Aktieselskabet Niro Atomizer, Soborg, Denmark

Filed Mar. 25, 1976, Ser. No. 670,265
Claims priority, application Sweden, Mar. 25, 1975, 7503484
Int. Cl.[2] F26B *7/00*
U.S. Cl. 34—12 **24 Claims**



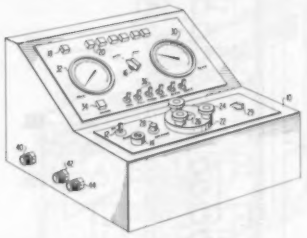
1. In a method of flash drying a fiber mass generally requiring subsequent grinding in an aqueous slurry in the manufacture of paper products wherein the fiber mass to be dried is disintegrated to comprise a disintegrated fiber mass which comprises substantially free single fibers, of which at least a part of the free single fibers are cellulose fibers, and wads or lumps of fibers and then the disintegrated fiber mass is subjected to a drying gas the improvement comprising exposing the said disintegrated fiber mass to flash drying by utilization of a drying gas at a temperature of at least 180° C, to at least partially dry the free fibers and then separating a substantial part of the free fibers from the wads and lumps of the disintegrated fiber mass whereby the grindability of the free fibers is not substantially reduced.

4,055,904

AUTOMATIC CRITICAL POINT DRYING APPARATUS

John E. Horne, Hyattsville, Md., assignor to Tousimis Research Corporation, Rockville, Md.

Filed Apr. 2, 1976, Ser. No. 672,923
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—45 **19 Claims**



1. In a critical point dryer for specimen preparation in electron microscopy, said specimen being dehydrated in a dehydrating fluid, said dryer including a specimen chamber in which said dehydrating fluid containing specimen is inserted, cooling means for cooling said chamber, filling means for filling said chamber with a transitional fluid having a critical temperature and critical pressure, purging means for purging said chamber of said dehydrating fluid, heating and pressurizing means for heating said transitional fluid above said critical temperature and pressurizing said transitional fluid above said critical pressure, bleeding means for controllably equalizing said chamber to atmospheric pressure, venting means for venting said chamber directly into the atmosphere, the improvement comprising:

automatic means for automatically and sequentially controlling said cooling means, said filling means, said purging means, said heating and pressurizing means, said bleeding means and said venting means.

4,055,905

TEACHING TYPEWRITER

Charles R. Budrose, Melrose, Mass., assignor to Upaya, Inc., Saugus, Mass.

Filed June 21, 1976, Ser. No. 698,411
Int. Cl.[2] G09B *13/00*
U.S. Cl. 35—5 **11 Claims**

1. A system for use with a typewriter including a keyboard having keys, said system comprising;

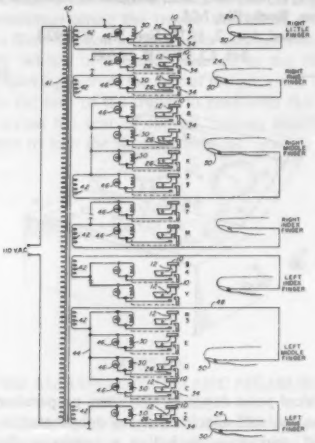
a plurality of blocking means associated, respectively, with each key capable of assuming two different positions, one for permitting key depression and one for preventing key depression,

each said blocking means being operable independent of the other blocking means,

glove means worn by the operator having a plurality of conductive patches, one at the tip of each finger of the glove means,

and means defining a plurality of separate circuit paths each including first conductor means extending from the conductive patch, means defining a potential difference source coupled to the first conductor means, electromechanical means coupled to the potential difference source for operating said blocking means and second conductor means associated with the key and coupling to the electromechanical means whereby an electrical path is com-

pleted between the potential difference source and the electromechanical means when the proper key is depressed to operate the blocking means to its key depression permitted position.

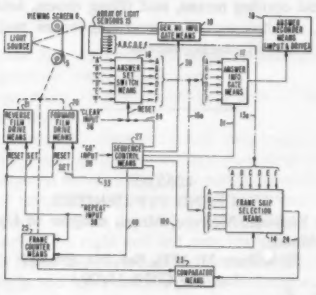


4,055,906

AUTOMATED INTERROGATING APPARATUS

Francis T. Thompson, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 12, 1976, Ser. No. 676,180
Int. Cl.[2] G09B 7/08
U.S. Cl. 35—9 A **3 Claims**



1. An automatic self-administered interrogating apparatus comprising,

film strip means for visually presenting a series of image frames at a viewing station, at least many of said image frames containing multiple answers viewable simultaneously at such station, and each such frame having an identification code affiliated with it, together with frame-count-advance codes respective to said answers,

answer selection means operable to indicate choice of any one, several, or all of the aforesaid answers,

recording means for storing said identification code and answer-choice information from said answer selection means,

frame-count-advance selection means essentially comprising a bit-polarity-dominant logic circuitry for selecting frame-count-movement information from among the codes of the chosen answers, and

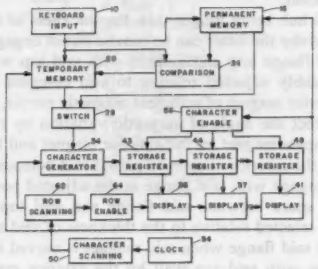
means for effecting advancing movement of said film strip means according to such frame-count-movement information selection.

4,055,907

CHARACTER SCANNED TEACHING MACHINE

Eugene Murl Henson, 14256 Caminata Soleado, San Diego, Calif. 92129

Filed June 9, 1976, Ser. No. 694,232
Int. Cl.[2] G09B 7/02
U.S. Cl. 35—9 R **9 Claims**



1. A teaching machine wherein an answer provided by a student in the form of a sequence of characters is displayed as each character is correctly indicated in said sequence by the student as determined by a character by character comparison of input character indications made by the student with a correct character indication sequence stored in the machine, comprising,

input means for providing an input character indication,

permanent memory means for storing a correct character indication sequence,

comparison means for comparing said input character indication with a stored character indication in a corresponding position in said stored correct character indication sequence, and for providing an enabling signal when said input character indication matches said stored correct character indication,

temporary memory means for storing correct input character indications in response to said enabling signal, in the sequence that said characters are correctly indicated at the input means,

a sequence of display devices for displaying characters represented by said input character indications stored in the temporary memory means, wherein each character is displayed in a matrix format consisting of rows and columns,

a sequence of storage registers corresponding to the sequence of display devices, each storage register for holding and providing signals to its corresponding display device for forming a character represented by an input character indication in the corresponding character sequence position in the temporary memory means,

character generating means for providing said character forming signals to the storage registers in response to input character indications received from the temporary memory means, wherein each character forming signal represents a single row of a character matrix,

character scanning means for sequentially addressing each character indication position in the temporary memory means to provide said character indication in said addressed position to the character generating means,

character enabling means for enabling the storage registers to provide character forming signals to the corresponding display devices in the sequence and at the rate that the corresponding character positions in the temporary memory means are addressed,

row scanning means for row by row scanning of the character generating means to provide character forming signals

representing a single row of said indicated character matricies to the storage registers,

row enabling means for enabling all of the display devices to display corresponding single rows of said character matricies at the same rate that the character generating means is scanned by the row scanning means and at such a rate that signals are received by all of the storage registers from the character generating means during the scanning of each row, and

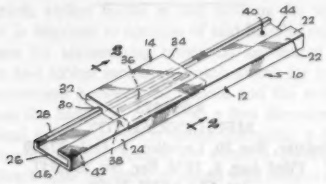
means for enabling the storage registers to receive character forming signals from the character generating means during the first half of the interval during which each row is scanned and for enabling the display devices to display said corresponding single rows of said character matricies during the second half of said interval.

4,055,908

READING DEVICE

Daniel H. Greene, 15910 Ventura Blvd., Encino, Calif. 91324, and Lawrence J. Greene, 1031 Foster City Blvd., Foster City, Calif. 94404

Filed Apr. 15, 1976, Ser. No. 677,322
Int. Cl.[2] G09B *17/02*
U.S. Cl. 35—35 R **9 Claims**



1. A device for training people to improve reading skills, comprising:

means for isolating a single line of reading material to be read from a page containing a plurality of lines of readable material including a frame having an open left end, and open right end and having at least one elongated member defining a trough between said open ends, one of said members having an edge underlying said single line of reading material, and said frame including a first stop pin mounted on the left end of the frame and a second stop pin mounted on the right end of the frame; and

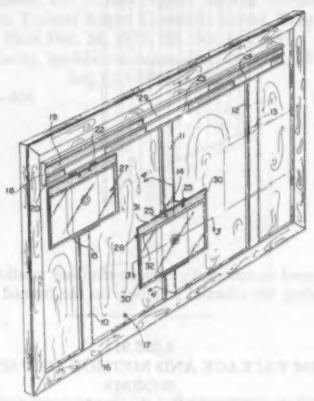
shutter means slidingly mounted in the trough of said isolating means for sequentially uncovering portions of said single line of reading material, whereby a reader may attack selected portions of said single line of material as said shutter means is moved from left to right on said isolation means, said shutter having a left edge and a right edge, each of said edges being capable of movement out of said open ends so that the opposite edge is positioned near the edge of the printed margin of the page, said left edge of said shutter being adapted to uncover portions of said line sequentially as said shutter is slid laterally along in said trough, said shutter being provided with an upper dead end groove and a lower dead end groove, said upper dead end groove being open adjacent one ege of the shutter in alignment with one of said pins and being closed between said edges in a location permitting movement of the opposite edge of the shutter past one margin of the page, said lower dead end groove being open adjacent the other edge of the shutter in aligment with the other pin and being closed between said edges in a location permitting movement of the opposite edge of the shutter past the other margin of the page.

4,055,909

DISPLAY AND SCHEDULING PANELS WITH DOCUMENT HOLDING ENVELOPE

Loren Dale Perry, 414 Parliament Road, Martinez, Ga. 30907

Filed May 21, 1976, Ser. No. 688,563
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—124.2 **7 Claims**



1. Display means for holding a plurality of documents of variable size fully visible in ordered sequence, comprising in combination,

a set of longitudinally disposed guide members arranged on a panel for retaining said documents in said ordered sequence,

a plurality of riders adapted for retention on and movement along said guide members each for displaying one of said documents,

friction means holding said riders frictionally in position on said guide members and permitting sliding movement therealong when the friction is manually overcome,

transparent envelope means affixed to said riders for visibly retaining removably inserted indicia documents of different dimensions,

and wherein said guide members comprise a set of parallel linear members disposed upon a panel whereby documents prepared in the normal course of business such as work orders, sales slips and invoices are held in said ordered sequence subject to removal and reordering of both the riders and the documents along said guide members.

4,055,910

PICTURE FRAME

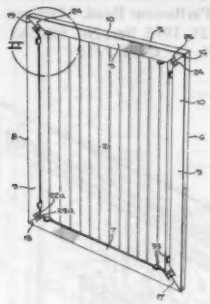
Hans H. Schmidt, 1905 Pontius Ave., Los Angeles, Calif. 90025

Filed July 1, 1976, Ser. No. 701,431
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—155 **24 Claims**

1. In a frame having channel members extending along each edge of framed material, each channel member abutting another channel member at the corner of the framed material, the improvement comprising:

locking means slidable between the framed material and a pair of abutting channel members at each corner of the framed material and means on the channel members for

receiving and holding the locking means whereby the locking means performs the dual function of holding the



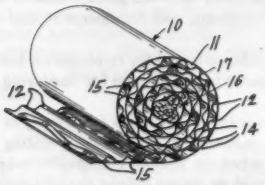
channel members together in abutting relationship and of holding the channel members on the framed material.

4,055,911

WORM PACKAGE AND METHOD OF PACKAGING WORMS

Elmo E. Aylor, 18650 Willow Lane, Hesperia, Calif. 92345

Filed June 7, 1976, Ser. No. 693,498
Int. Cl.[2] A01K *97/04*
U.S. Cl. 43—55 **17 Claims**



1. A worm package containing a plurality of worms comprising at least one section of water absorbent sheet material supported in overlying spaced relation over another section of sheet material to form worm compartments between the layers of said sheet material, and

spacer means disposed between said layers of sheet material dimensioned to provide a space between said layers to permit a worm to crawl therebetween for snug-fit residence therebetween, said package having an entrance opening to said space for entry of worms therein.

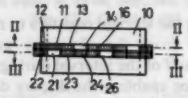
4,055,912

TOY CONSTRUCTION MEMBERS

Hans-Josef Anschutz, Berlin, Germany, assignor to Anschutz Handels-und Verwaltungs- GmbH, Berlin, Germany

Continuation of Ser. No. 408,916, Oct. 23, 1973, abandoned, which is a continuation of Ser. No. 121,268, March 5, 1971, abandoned. This application Feb. 4, 1976, Ser. No. 655,225
Claims priority, application Germany, Mar. 7, 1970, 2010896
Int. Cl.[2] A63H *33/08*
U.S. Cl. 46—25 **6 Claims**

1. A toy construction set comprising a plurality of members, each of said members comprising a unitary frame of open polygonal shape having outer peripheral planar edge surfaces and a planar cover member for sheathing the open side of said frame, said frame having two parallel rows of continuously alternating tabs and recesses located substantially along the center line of at least one of said edge surfaces, each of said rows comprising a plurality of adjacent alternating tabs raised perpendicularly from the plane of said edge surface and recesses conformed in depth to said tabs, said tabs and recesses being respectively below and over the plane defining said edge surface and being mutually conformed trapezoids of the same height and width with the tabs tapering inwardly in the outward direction at an angle of 45°, the tabs of one row being offset relative to the tabs of the other row by a distance equal



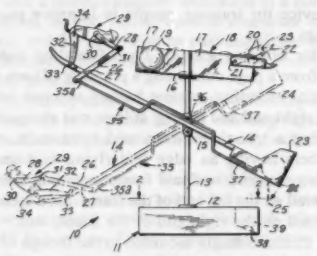
to one of said tabs or recesses whereby two or more of said frames may be interconnected with the tabs and recesses of one interengaging with the conforming recesses and tabs of the other and the planar surfaces of the corresponding peripheral edges in abutment, said cover member being provided with tabs are recesses on its surface which are adapted to interconnect with the tabs and recesses of said frames.

4,055,913

MECHANICAL TOY

John B. Sindelar, Box 30, Loyalton, S. Dak. 57459

Filed Aug. 5, 1976, Ser. No. 694,547
Int. Cl.[2] A63H *29/08*
U.S. Cl. 46—143 **2 Claims**



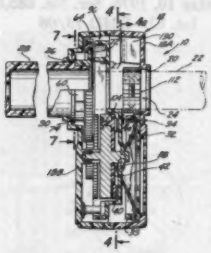
1. A mechanical toy, comprising a base for support on a stationary surface, a pair of vertically upright posts supported on said base, a horizontally inclined container upon an upper end of said posts, said container holding a plurality of balls, an opening in a downwardly inclined end of said container for rolling of said balls out of said container, a U-shaped retainer pivoted around said end opening, normally preventing said balls to roll outward; a rod pivoted at its intermediate portion over a roller pivoted on a pivot pin between an intermediate portion of said posts, one end of said rod having a cup, an upper edge of said cup pivoting said U-shaped retainer upwardly when said rod end is upwardly pivoted, so to release one said ball from said container into said cup, said cup containing said ball being heavier than an opposite end of said rod, so to cause said cup to downwardly pivot about said roller, an underside of said cup abutting with a sloping chute of said base, when said rod cup is downwardly pivoted, and means for transferring said ball from said cup to said chute, when said cup abuts said chute.

4,055,914

SOUND PRODUCING DEVICE

Michael Ieda, Fort Solanga, and Walter Friedman, Centereach, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,230
Int. Cl.² A63H *5/00*
U.S. Cl. 46—192 **26 Claims**



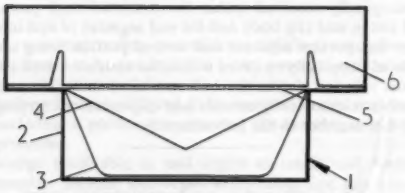
1. A device for producing sound comprising a housing, an elongated handle rotatably mounted in said housing for rotation in opposite directions about the handle's longitudinal axis, resonator means mounted in said housing for producing noise when struck, striker means in said housing for striking said resonator in response to rotation of said handle, and transmission means for transmitting rotational movement from said handle to said striker including clutch means for transmitting rotary movement between the handle and the striker means only when the handle is rotated in a first direction about its longitudinal axis; said clutch means including a first clutch plate mounted on said handle for rotation therewith and a second clutch plate rotatably mounted with respect to said first clutch plate; said first and second clutch plates including cooperating means for transmitting rotation from said first clutch plate to said second clutch plate only when the handle is rotated in said first direction.

4,055,915

METHOD OF AND APPARATUS FOR TREATING PLANT ORGANISMS

Zeera Polyandre Charnoe, Alvah, (near Banff), Scotland, assignor to Devatron Limited, Insch, Scotland

Filed Sept. 29, 1975, Ser. No. 617,505
Claims priority, application United Kingdom, Sept. 28, 1974, 42255/74
Int. Cl.² A01C *1/00*
U.S. Cl. 47—58 **13 Claims**



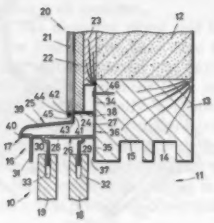
1. A method of inducing acceleration of the metabolisms of plant organisms such as seeds and plants comprising the steps of testing a plant organism by subjecting it to sound at a plurality of frequencies in turn and, while each frequency is being applied, detecting at least one substantially immediate response characteristic of at least part of the plant organism to determine a frequency favored by the plant organism and thereafter applying sound at said favored frequency to the plant organism while the latter is subjected to the conditions of heat, light and moisture normally provided.

4,055,916

EXTERIOR WINDOW UNIT HAVING FRAME HEADER

Yukio Yamamoto, and Mitsuo Nagase, both of Kurobe, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,155
Claims priority, application Japan, Dec. 26, 1974, 50-3881[U]
Int. Cl.² E06B *3/26*
U.S. Cl. 49—404 **6 Claims**



1. An exterior window unit for being mounted on the outside of an opening in a building wall, such wall having exterior siding and a wall header extending along the opening, said exterior window unit comprising:

a. a frame;

b. a pair of horizontally movable sashes mounted within said frame in parallel closely spaced planes; and

c. said frame including a frame header comprising

1. a vertical mounting plate adapted to be attached to the outside of said wall header,
2. a first plate directly joined to and projecting horizontally outwardly from said mounting plate,
3. a pair of horizontally elongated flanges projecting downwardly from said first horizontal plate into slots in the upper ends of said sashes, respectively, and along which flanges said sashes are individually guided during horizontal movement,
4. a second plate joined to and projecting horizontally outwardly from said mounting plate for a distance overlying only the inner one of said sashes and spaced upwardly from said first plate, said second plate being adapted to engage the horizontal bottom edge of said exterior siding and
5. a third plate extending outwardly and downwardly from said second horizontal plate to said first horizontal plate in overlying relation to at least the outer one of said sashes.

4,055,917

DOOR AND THRESHHOLD ASSEMBLY

John Coller, Redondo Beach, Calif., assignor to Elixir Industries, Gardena, Calif.

Filed Oct. 14, 1975, Ser. No. 621,830
Int. Cl.² E06B *1/70*
U.S. Cl. 49—469 **18 Claims**

1. For use with a door hinged in a doorway, a threshhold assembly comprising

an elongated subpan adapted to be mounted in said doorway and to extend across the doorway, said subpan including means for effecting drainage therefrom, an elongated threshhold member mounted to said subpan and positioned above a forward portion thereof, an elongated upper pan mounted to said subpan and spaced above said subpan, said upper pan extending along the length of said subpan and across the width of said subpan from a rear edge thereof to a rear edge of said threshhold member,

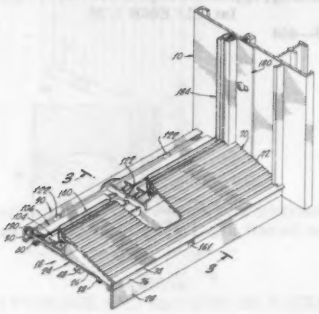
said upper pan having a width substantially equal to the thickness of said door,

drainage means interconnecting said subpan and upper pan,

a door jamb upstanding at a side of said doorway,

a first flexible elongated sealing strip fixed to and extending along said jamb,

a second flexible elongated sealing strip fixed to and extending along the rear edge of said threshhold member,



said second sealing strip having an elongated upstanding fin that overlaps said first sealing strip at adjacent ends of said strips, one of said sealing strips adapted to be engaged by said door to thereby be pressed against the other of said sealing strips at said jamb and provide a tightly sealed corner at the bottom of said jamb.

4,055,918

GRINDING MACHINE

Börje Brålander, Svanesund; Åke Claesson, Floda; Lars-Erik Henningsson, Goteborg, and Johan Scheel, Partille, all of Sweden, assignors to Centro-Maskin Goteborg AG, Goteborg, Sweden

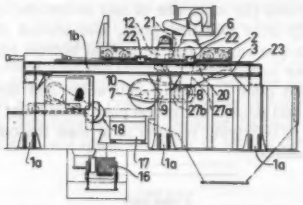
Filed June 8, 1976, Ser. No. 693,741

Claims priority, application Sweden, June 10, 1975, 7506620

Int. Cl.² B24B *7/02*

U.S. Cl. 51—

5 Claims



1. A grinding machine which comprises:

a rigid frame structure,

a cross travel carriage movably supported on said rigid frame structure,

a grinding wheel,

a grinding pendulum, and

a drive motor, wherein said grinding stand is rotatably supported by said cross travel carriage in the horizontal plane about a pin located straight above center of said grinding wheel by a pivot fixed between said cross travel carriage and said grinding stand and by wheels on said grinding stand which cooperate with rails on said cross travel carriage, and

wherein said grinding wheel is supported by a grinding pendulum carried by said grinding stand via an intermediate shaft fastened on said grinding stand, and

wherein said drive motor for driving the grinding wheel is rigidly secured on said rotatable grinding stand.

4,055,919

PACK UNIT AND MOUNTING MEANS THEREFOR

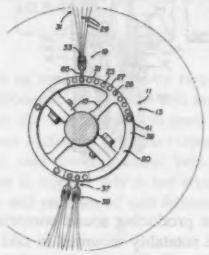
James A. Belanger, Northville, Mich., assignor to Belanger, Inc., Northville, Mich.

Filed May 10, 1976, Ser. No. 685,015

Int. Cl.² B24D *13/06*

U.S. Cl. 51—334

25 Claims



1. A pack unit adapted to be mounted on the hub structure of a rotary finishing wheel, said hub structure including a plurality of circumferentially spaced, elongated, quasi-cylindrical, key-hole-type slots about the periphery thereof, each of said slots having an inner portion and a restricted neck passage opening outwardly therefrom, each of the said slots further including a longitudinal slot axis substantially parallel to the rotational axis of said finishing wheel, said pack unit comprising at least one flap-like member of finishing material having a radially outer portion adapted for engaging the workpiece and a radially inner portion adapted to be clampably secured; a unitary, integrally-formed, elongated clip member including a clip body, a pair of radially outwardly extending clamping arms adapted for clampably receiving the radially inner portion of said flap-like member therebetween, the radially inner portion of said clip body being provided with an elongated, radially inwardly disposed, quasi-cylindrical, key-hole-type slot having an inner portion and a restricted neck passage opening outwardly therefrom; and a unitary link member having a dumb-bell-shaped configuration and having a first slot-engaging solid head portion of generally quasi-cylindrical configuration telescopically received within the elongated slot of said clip member, a second slot-engaging solid head portion of generally quasi-cylindrical configuration adapted to be telescopically received within an elongated slot of the hub structure, and an intermediate link portion integrally interconnecting said solid head portions, the end segment of said intermediate link portion adjacent said first head portion being telescopically received within the restricted neck passage of said slot in said clip body and the end segment of said intermediate link portion adjacent said second portion being adapted to be telescopically received within the restricted neck passage of the selected slot in the hub structure, such that said link member telescopically mounts said clip member carrying said flap-like member to the hub structure.

4,055,920

LOAD BEARING CONSTRUCTION UNIT

Otto Alfred Becker, Robert Koch Strasse 59, 66 Saarbrucken 6, Germany

Filed Dec. 31, 1975, Ser. No. 645,651

Claims priority, application Germany, Dec. 31, 1974, 2461940

Int. Cl.² E04C *3/26*

U.S. Cl. 52—2

17 Claims

1. A load-bearing construction unit comprising

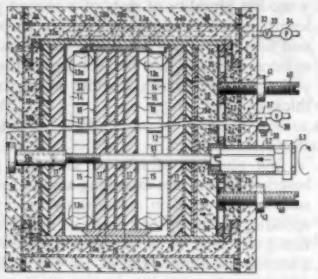
a. outer composite shell assemblies of high flexural strength forming the sides of said unit, border assemblies compris-

ing the top and bottom of said unit, said shell and border assemblies defining a cavity therewithin,

b. composite supporting plates positioned within said outer shell assemblies,

c. an intermediate load-bearing composite group disposed in said cavity between and spaced from said outer shell assemblies,

d. cellular web assemblies disposed between said intermediate composite group and said composite supporting plates,



the lateral edges of said web assemblies being tightly and compressively engaged by said intermediate composite group and said composite supporting plates thereby to seal off the individual cells in said web assemblies, whereby the desired pressure conditions can be maintained in said web assemblies,

e. first screw means extending through said unit for stressing said outer shell assemblies, and

f. second screw means applying compressive pressure to the remaining elements within said cavity.

4,055,921

REGLETS AND ASSOCIATED COMPONENTS

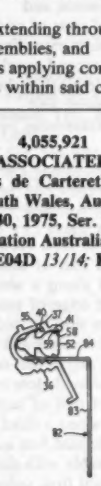
Arnold Edward Francis de Carteret, 16/21 Harrison Stret, Neutral Bay, New South Wales, Australia (2089)

Filed Oct. 30, 1975, Ser. No. 627,352

Claims priority, application Australia, Nov. 19, 1974, 9672/74

Int. Cl.[2] E04D *13/14;* E04B *1/54*

U.S. Cl. 52—61 **6 Claims**



6. A weatherproofing system for a building, comprising a reglet adapted to be embedded in a cast concrete wall relative an area to be protected from the weather,

a flashing member adapted to be received in said reglet and including a portion for covering the building area to be protected,

a wedge receivable in said reglet to retain said flashing member therein; said reglet comprising first and second elongate wall members arranged in substantially parallel transversely spaced relationship,

an elongate substantially transversely curved member connecting adjacent longitudinal edges of said wall members to define an elongate channel like structure,

a rib extending along the external surface of said channel in the region of the connection between one said wall member and said curved member to provide an embedment key; said one wall member comprising a substantially planar portion having a wall element extending along the other longitudinal edge thereof and projecting substantially normally from said planar portion towards the other one of said wall members to provide an inner abutment face,

a second wall element connected to the inner longitudinal edge of the first said wall element and projecting outwardly of said channel, said second wall element having a substantially flat surface facing said other wall member and extending therealong between said abutment surface and the free longitudinal edge of said second wall element, said second wall element being angled relative to said other wall member to define a channel opening transversely narrower than the distance between said planar portion and said other wall member,

a plurality of ratchet like elements along said second wall element between the free longitudinal edge thereof and said substantially flat surface thereof and having a depth less than the depth of said abutment face; said flashing member comprising a substantially L-shaped elongate member, one leg of said L-shaped member having a return bent portion receivable in said channel with the longitudinal edge thereof engaged with said abutment surface, the other leg of said flashing member extending in a direction away from said return bent portion to cover said area to be protected;

said wedge comprising an elongate member having a front portion adapted to engage the bent portion of said flashing member and urge it against the curved member of said reglet, a central portion receivable between opposite legs of the return bent portion of said flashing member to urge said legs into engagement with the wall members of said reglet and retain said longitudinal edge of said flashing behind said abutment face, a rear portion having a plurality of ratchet like elements extending therealong and adapted to engage the ratchet like elements of said second wall element to retain said wedge in said reglet and a rear face portion for closing off the channel opening of said reglet.

4,055,922

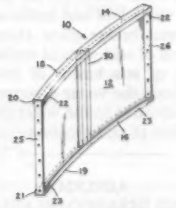
FRAME STRUCTURE FOR SWIMMING POOL

Harold John Ellington, Basking Ridge, and Roy C. McNeil, Paterson, both of N.J., assignors to Heldor Associates, Inc., Clifton, N.J.

Filed Sept. 24, 1976, Ser. No. 726,127

Int. Cl.[2] E04H *3/18;* E04B *1/32*

U.S. Cl. 52—169.7 **19 Claims**



1. A pool frame structure for forming freeform pools, said pool frame structure including a plurality of panel segments secured in abutting end to end relationship to define a closed geometic figure, wherein each of said panel segments comprises:

a first generally U-shaped channel, said first generally U-shaped channel being curved to define a radius;

a second generally U-shaped channel, said second generally U-shaped channel being curved to define a radius equal to the radius defined by said first U-shaped channel; and

a wall plate having an upper edge and a lower edge, said wall plate being rigidly secured to said first and second U-shaped channels at its upper and lower edges respec-

tively and said wall plate further having end flanges extending between said upper edge and said lower edge, said end flanges for being in abutting surface-to-surface contact with the end flanges of next adjacent panel segments upon assembly of said panel segments to form said freeform pool.

4,055,923

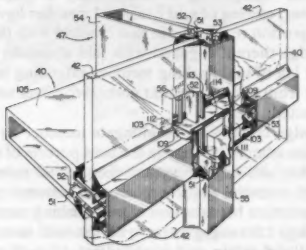
WALL FRAMING SYSTEM AND COMPONENTS THEREOF

Lawrence F. Biebuyck, Dallas, Tex., assignor to Howmet Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 560,820, March 21, 1975, Pat. No. 4,008,552, which is a continuation of Ser. No. 378,321, July 11, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,158

Int. Cl.[2] E04B *2/88*

U.S. Cl. 52—235 **13 Claims**



1. In a wall structure having hollow horizontal and vertical panel gripping mullions and having a mullion crossing at which said horizontal and vertical mullions cross, said crossing being of the type in which the vertical mullions pass through the crossing and the horizontal mullions abut the vertical mullions at the crossing, said mullions comprising interior and exterior pieces attached together internally at spaced intervals, the improvements comprising:

water diverters mounted internally in each of the horizontal mullions, said diverters each extending from a point in the mullion interiorly of and above the lower edge of an upper panel gripped by the horizontal mullion to a point in the mullion exteriorly of and below the upper edge of a lower panel gripped by the horizontal mullion;

means in said horizontal mullions adjacent the exterior-most portions of said water diverters for permitting egress of water from the interior of said mullions;

and a water diverter bridge piece extending horizontally through a portion of said vertical mullions at the crossing between points of attachment of interior and exterior pieces thereof from the water diverter in one horizontal mullion of said crossing to the water diverter in the other horizontal mullion of said crossing.

4,055,924

INEXPENSIVE AND DISASSEMBLABLE STRUCTURAL UNITS

Emil R. Beaver, Jr., 4148 S. Crane Road, Tipp City, Ohio 45371

Filed Mar. 10, 1976, Ser. No. 665,712

Int. Cl.[2] E04B *1/00*

U.S. Cl. 52—262 **3 Claims**

1. A class of non-permanent structures characterized by locking and interlocking panels of uniform thickness which may be assembled in a variety of modes to provide a plurality of different structures, said panels including:

a. a first plurality of rectangular panels, each such first panel having:

1. a first plurality of slots of a first predetermined length, said first slots extending longitudinally along a first long edge of said first panel in a uniformly spaced array, with each of said first slots having a width equal to said uniform thickness; and

2. a second plurality of slots of a second predetermined length, said second slots extending perpendicularly to said first long edge of said first panel and being spaced at intervals along said first long edge thereof, said second slots also having a width equal to said uniform thickness; and

b. a second plurality of longitudinal vertical panels, each such panel having:

1. a first plurality of tabs of said first predetermined length, said first tabs extending along a first long edge of said second panel in a uniformly spaced array corresponding to the spaced array of said first slots of said first panel so as to be engageable therewith;

2. a second plurality of tabs of one-half said first predetermined length, said second tabs extending along a second long edge of said second panel in a uniformly spaced array and positioned thereon so as to be engageable, in a first relative orientation of said first and second panels, and engageable in a second relative orientation of said first and second panels, within the other half of the first slots of said first panels; and

3. a third plurality of slots of said second predetermined length, said third slots extending perpendicularly to the long edges of said second panel and being spaced therealong in manner identical to the spacing of said second slots of said first panel; and

c. a third plurality of transverse vertical panels, each such third panel having:

1. a third plurality of tabs of said second predetermined length positioned along a first edge of said third panel, said third tabs being engageable with second slots of said first panel;

2. a fourth plurality of tabs, each comprising one-half of said third tab and half of said second predetermined length, positioned along a second edge of said third panel, said second edge of said third panel being disposed on opposite side of said third panel from first edge, said half tabs positioned thereon so as to be engageable with the fourth half-tabs of another said third panel within the second slots of said first panel; and

3. a fifth plurality of tabs of said second predetermined length positioned along a third edge of said third panel and intermediate to said first and second edges thereof, so as to be engageable with said third slots of said second panel when said first, second, and third panels are joined at right angles to each other.

4,055,925

EXPANSION JOINT AND FLASHING CONSTRUCTION

Max Wasserman, Chestnut Hill, and Martin E. Gorman, Jr., Belmont, both of Mass., assignors to Sandell Mfg. Co., Inc., Cambridge, Mass.

Filed July 1, 1976, Ser. No. 701,555

Int. Cl.[2] E04D *3/38;* E04B *1/68*

U.S. Cl. 52—403 **7 Claims**

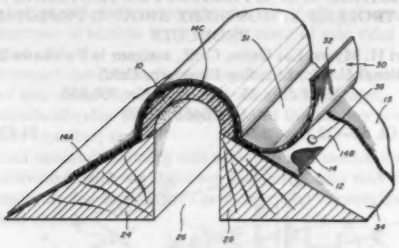
1. Expansion joint construction for bridging and insulating a gap between two structural members comprising;

an insulating strip means,

a bituminous coated woven wire cloth means affixed on one side to and having flexible marginal portions extending beyond edges of said insulating strip means,

and a cover means having a width greater than the width of said bituminous coated woven wire cloth means and hav-

ing a center area affixed on the other side of said woven wire cloth means with marginal portions of said cover means extending beyond and free of said marginal portions of said wire cloth means, said cover means comprising a rubbery layer having a durable exposed outer surface and an integral fabric backing having an exposed inner surface along said marginal portions, and adhesive means affixing the other side of said bituminous coated woven wire cloth means to said fabric backing.



4,055,926

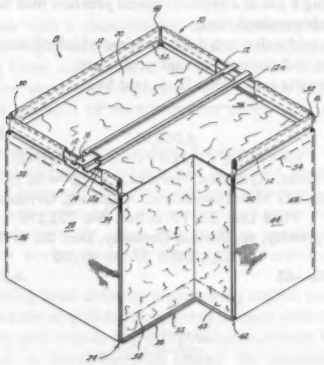
REFRACTORY FIBER BLANKET MODULE

Carlisle O. Byrd, Jr., Houston, Tex., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 603,391, Aug. 11, 1975, Pat. No. 4,002,996, which is a continuation-in-part of Ser. No. 475,439, June 3, 1974, Pat. No. 3,952,470. This application Jan. 7, 1977, Ser. No. 757,748

Int. Cl.[2] E04B *1/80*

U.S. Cl. 52—475 **9 Claims**



1. A module for refractory fiber insulation of a wall of a furnace or like equipment, comprising:

a. a supporting frame member having at least two opposite sides;

b. a band of metal oxide cloth suspended between said opposite sides of said frame member to form a pocket;

c. insulating means mounted in said pocket to insulate the wall of the furnace; and

d. means for attaching said supporting frame member to the wall of the furnace.

4,055,927

CONCRETE WALLS AND REINFORCEMENT CAGE THEREFOR

George John Tamaro, Leonia, N.J., assignor to Icos Corporation of America, New York, N.Y.

Division of Ser. No. 603,982, Aug. 12, 1975, Pat. No. 4,005,582. This application July 2, 1976, Ser. No. 701,777

Int. Cl.[2] E04G *21/12*

U.S. Cl. 52—577 **3 Claims**

1. For use in constructing a vertical concrete underground panel wall section by the slurry trench excavation method, a reinforcement cage assembly, a pair of spaced flanged steel beams, each beam having a length at least equal to the depth of said panel wall section and a web portion substantially equal to the width of an elongated excavation for said panel wall section, the web portions of each said flanged beam being substantially parallel, means securing said cage in interfitting relation to said flange surfaces, respectively, the improvement comprising block out means removably secured in spaced relation to said steel reinforcing cage, said block out means having a flat surface which is coplanar with flanges on both said pair of beams and said block out is constructed to have low bouyancy such that when immersed in slurry and/or concrete said block out means does not affect the positioning or alignment of said flanged beams and reinforcement cage.

4,055,928

CASING BRICK, AND A METHOD AND APPARATUS FOR MAKING THE SAME

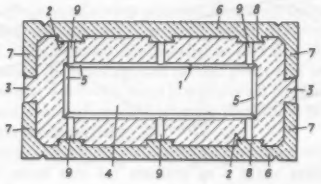
Otto Magerle, Hausergasse 11, Klagenfurt (Kaernten), Austria

Filed Apr. 14, 1976, Ser. No. 676,642

Claims priority, application Austria, Apr. 18, 1975, 3011/75; May 21, 1975, 3862/75

Int. Cl.[2] E04B *5/04*

U.S. Cl. 52—612 **8 Claims**



1. A casing brick, comprising:

a hollow and unitary insulating insert;

a concrete shell consisting of two separate parts having a spacing therebetween and substantially enclosing said insert, said two separate parts being free of contact over the entire periphery thereof, said insert having two projections thereon received in the spacing between said two parts of said shell; and

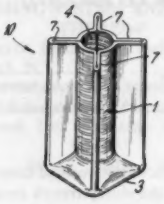
interlocking means for connecting each shell part to said insert.

4,055,929

THREADED ANCHOR

Nicholas F. Stancati, Basking Ridge, and Peter Garner, Chatham, both of N.J., assignors to Acta Limited, Manville, N.J.

Filed Oct. 8, 1976, Ser. No. 730,817
Int. Cl.[2] E04B 1/41
U.S. Cl. 52—705 1 Claim



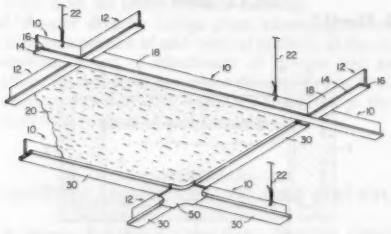
1. A heavy duty threaded anchor for embedding in a cementious material, constructed from a single square sheet of metal comprising a unitary elongated member of generally cylindrical configuration, said cylindrical member being open at one end and interiorly threaded along its length, the other end of said cylindrical member being closed by a pyramid shaped base member having a substantially square portion which is greater in size than the diameter of the cylindrical member and four inclined surfaces extending from said square portion to the cylindrical member, said base member being perpendicular to the longitudinal axis of the cylindrical member and unitary with said cylindrical member; and four radial, substantially rectangular flange members, said flange members being unitary with said cylindrical member and extending along the entire length of the outer surface of the cylindrical member, said flange members being unitary with the base member and disposed at right angles to each other.

4,055,930

GRID CEILING TRIM

Roger Neil Weinar, and John Anthony Eder, both of Tonawanda, N.Y., assignors to Ceiling Resurfacing Systems, Inc., Eggertsville, N.Y.

Filed May 27, 1976, Ser. No. 690,609
Int. Cl.[2] E04C 2/38; E04B 1/00
U.S. Cl. 52—717 8 Claims



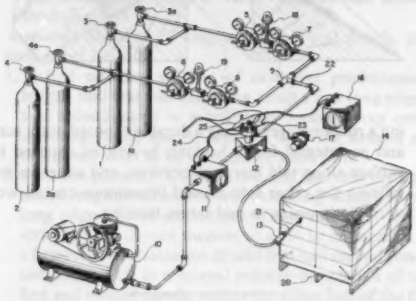
1. A resilient decorative trim strip for covering normally exposed lower surfaces of horizontal flanges of beams for supporting ceiling panels which comprises a horizontal lower flange, a substantially horizontal upper flange slightly less than half the width of the lower flange and a short vertical web connecting the horizontal flanges and forming a J-member with them, with the leg of the J being horizontal, with the end of the substantially horizontal upper flange away from the vertical web being angled upwardly therefrom to facilitate placement of the strip over a horizontal flange of the ceiling panel supporting beam and with the opening between the flanges of the strip being such size that the flanges of the strip contact the flange of the beam.

4,055,931

METHOD AND APPARATUS FOR PROVIDING A CONTROLLED ATMOSPHERE AROUND PERISHABLE PRODUCTS

Albert H. Myers, Los Gatos, Calif., assignor to Furukawa International U.S.A., Inc., San Francisco, Calif.

Filed July 28, 1976, Ser. No. 708,853
Int. Cl.[2] B65B 31/08
U.S. Cl. 53—22 B 14 Claims



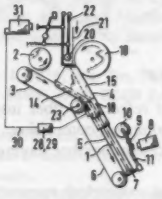
1. A method for protecting perishable products comprising the steps of:
sealing the product within an air-tight flexible bag;
inserting into said bag a probe connected to a multi-position valve;
moving said valve to a first position which connects said probe to a vacuum pump;
evacuating air from said bag to a predetermined pressure below atmospheric pressure;
moving said valve to a second position which connects said probe to a source of said gas;
introducing a predetermined volume of gas into said bag by flowing a gas at a predetermined pressure into said bag for a predetermined time;
moving said valve to a third position which closes the source of gas and vacuum to said probe; and
withdrawing said probe from said bag.

4,055,932

ENVELOPE-STUFFING MACHINE

Rudolf Wanner, Aystetten, Germany, assignor to Böwe Böhler & Weber KG Maschinenfabrik, Augsburg, Germany

Filed Dec. 20, 1976, Ser. No. 752,170
Claims priority, application Germany, Dec. 20, 1975, 2557670
Int. Cl.[2] B65B 57/06, 43/30
U.S. Cl. 53—63 10 Claims



1. A machine for introducing an insert between spreadable sides of a cover forming a mouth to receive said insert upon the spreading of said sides, said machine comprising:

means for displacing said cover into an insertion station;

a suction head at said station having a pair of perforated suction surfaces juxtaposed with the respective sides of a cover disposed at said station, a suction chamber cmmunicating with the perforations of said surfaces, and means for evacuating said chamber whereby the suction generated at said surface spreads said sides and undergoes an increase in suction level upon contact of said sides with said surfaces;

a transport mechanism for feeding said insert into the mouth of said cover formed upon spreading of said sides;

a threshold-value sensor responsive to the suction level in said chamber; and

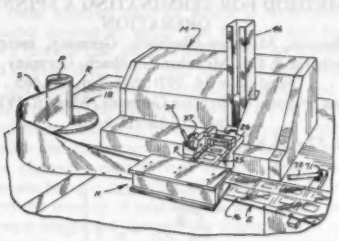
circuit means connecting said sensor to said mechanism for activating same to introduce said insert into said cover upon the development of a predetermined vacuum level in said chamber.

4,055,933

APPARATUS FOR PACKAGING PHOTOGRAPHIC SLIDES IN ENVELOPES

Edward W. Getsch, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Aug. 29, 1975, Ser. No. 608,836
Int. Cl.² B65B *5/04, 43/12, 43/26*
U.S. Cl. 53—187 **5 Claims**



1. For use with a photographic slide mounting machine of the type having means for mounting slide transparencies in a supporting frame and means to eject the mounted slides from said machine; apparatus for packaging in a single multi-pocket envelope a plurality of such mounted slides, said apparatus comprising:

means supplying a continuous flexible strip of envelope material formed to define a pair of spaced apart parallel rows of connected pockets, each row including a plurality of pockets arranged in opposed spaced apart relation to the pockets of the other row to form opposed pairs of pockets having inwardly facing slide-receiving mouth openings,

a positioning head defining a packaging station and having said flexible strip slidably mounted thereon with means for holding said strip in doubled-back substantially U-shaped position to simultaneously expose the opposed mouth openings of a selected pair of pockets positioned at said packaging station,

a shiftable guide track for transporting mounted slides from the ejecting means of the slide mounting machine to the packaging station and including means for selectively aligning said track with the mouth opening of one of said pockets to permit insertion of the slides successively into said respective pockets of said envelope from the slide ejecting means, and

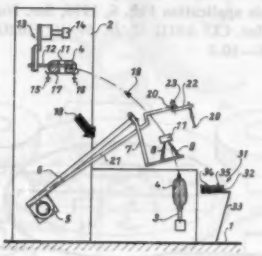
means for presenting successive pairs of pockets at said packaging station.

4,055,934

BAND APPLYING DEVICE FOR A SKEIN WINDING MACHINE

Roland Leveugle, Peruwelz, Belgium, assignor to Croon & Lucke Maschinenfabrik GmbH & Co. KG, Mengen, Germany

Filed July 14, 1976, Ser. No. 705,261
Claims priority, application Germany, July 19, 1975, 2532432
Int. Cl.² B65B *13/00*
U.S. Cl. 53—198 B **8 Claims**



1. A band applying device for use with a skein winding machine, the device applying a band to a completely wound skein mounted on a winding mandrel of the winding machine, the device, after applying the band to the skein, removing the skein from the mandrel and transferring the skein to a deposit location, said device comprising:

a magazine for accommodating a stack of collapsed bands;

a first pivot arm pivotally connected to the skein winding machine for movement in a first plane, said first pivot arm supporting two banding flaps, the inner surfaces of said flaps being provided with barbs for carrying the skein, said flaps being adapted to receive a band when said first pivot arm is in an initial setting;

a drive mechanism for pivoting said first pivot arm in a first direction from said initial setting towards the mandrel thereby pushing a band carried by said flaps over the skein, said drive mechanism being adapted for pivoting said first pivot arm in a direction opposite said first direction for removing the skein from the mandrel and for transferring the skein to the deposit location, said drive mechanism being further adapted for pivoting said first pivot arm in said first direction for removing said flaps from said skein and for returning said first pivot arm to said initial setting;

retention means operatively associated with the deposit location for retaining the banded skein in the deposit location while said flaps are being removed;

a second pivot arm having one end pivotably connected to the skein winding machine for pivotal movement in a second plane substantially parallel to said first plane;

driving means for pivoting said second pivot arm between a first position wherein a band is withdrawn from said magazine and a second position wherein the band is positioned over said banding flaps;

a rotary arm articulatedly fastened to the other end of said second pivot arm for rotation in a plane substantially perpendicular to said first and second planes;

band holding means attached to said rotary arm for securing, holding, positioning, and placing the band over said holding flaps;

driving means for rotating said rotary arm between a first position associated with said magazine wherein said band holding means withdraws a band from said magazine, the band being opened as it is withdrawn from said magazine, and a second position associated with said banding flaps wherein said band holding means positions and places the band over said banding flaps, said banding flaps in said initial setting of said first pivot arm being disposed in the

path of rotation of said band holding means from said first position to said second position.

4,055,935

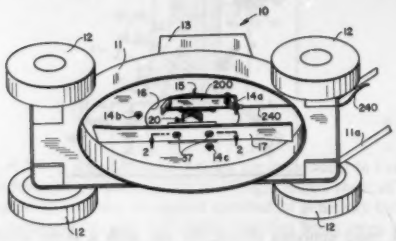
CLUTCH BRAKE MECHANISM FOR LAWNMOWERS

William R. Malion, 7591 Pinehurst Road, Mentor on the Lake, Ohio 44060, and John E. Watkins, 9674 Fairmont Road, Novelty, Ohio 44072

Continuation of Ser. No. 459,540, April 10, 1974, abandoned. This application Feb. 6, 1976, Ser. No. 655,866

Int. Cl.[2] A01D *75/18, 69/10;* **H02G** *11/00*

U.S. Cl. 56—10.3 **12 Claims**



3. In a lawnmower of the type including a drive shaft adapted for connection to a source of rotary motion, a rotatably mounted blade, and drive system for selectively drivingly connecting the drive shaft and the blade, the improvement wherein the drive system includes a combination clutch-brake device, comprising:

a. an input member coupled to the drive shaft and having a drive portion formed thereon including peripheral wall portions concentric about an axis;

b. an output member coupled to the blade and positioned near said input member;

c. said members being relatively rotatable about said axis;

d. spring means supported on said output member for rotation therewith and extending around and in engagement with said input member to normally establish a driving connection therebetween which is operable, when said input member is rotated in a selected direction, to drive said output member;

e. braking means for interrupting said driving connection and for braking the rotation of said output member, including:

i. sleeve means positioned around portions of said spring means and connected to said spring means for rotation therewith;

ii. restraining means including a spring steel brake band having a coiled central region extending around said sleeve means and also having opposite end regions extending away from said coil and intersecting substantially at right angles;

iii. biasing means normally biasing said central region into braking engagement with said sleeve means to restrain the movement thereof to release the grip of said spring means on said input member thereby interrupting said driving connection, and to restrain the rotation of said output member;

iv. operating means connected to said restraining means and for selectively releasing the braking engagement between said central region and said sleeve means to permit rotation of said output member;

v. bracket means, including a bracket movably carried near one side of said sleeve means, connecting with one of said end regions for restraining the brake band against rotation with said sleeve means, said end regions extending to positions overlying said bracket, said bracket being formed from a strip of metal with opposite end portions bent away from the plane of the strip to define first and second end flanges, said bracket including a mounting hole formed therethrough near said first end flange, the connection between said one end and said mounting bracket being located along a line which is tangent to said central coiled region and extending through said mounting hole;

vi. said operating means including a control cable connected to the other of said end regions for moving said other end region to selectively release and establish braking engagement between said coiled central region and said sleeve means, said control cable being provided with a shield secured to said first end flange; and

vii. said biasing means connecting with said other end region and with said bracket to bias said other end region in a direction which will tighten the grip of said coiled central region around said sleeve means, said biasing means including a tension coil spring connected at one end to said other end region and at the other end to said second end flange.

4,055,936

METHOD FOR TERMINATING A SPINNING OPERATION

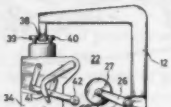
Hans Raasch, Monchen-Gladbach, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed May 14, 1976, Ser. No. 686,465

Claims priority, application Germany, May 16, 1975, 2521850

Int. Cl.[2] D01H *9/16*

U.S. Cl. 57—34 R **4 Claims**



1. In a method for terminating the spinning operation in a spinning machine having a loosening-up and a feeding device for slivers, the steps of running a sliver having a substantially full cross section with a substantially uniform count over the entire length thereof through the sliver feeding device and the fiber loosening-up device and cleanly cutting the sliver transversely immediately upstream of the feeding device in direction of feed of the sliver to provide a sliver end which retains said substantially full cross section and substantially uniform count.

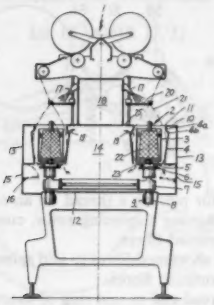
2. In apparatus for carrying out a method of terminating the spinning operation in a spinning machine having a loosening-up and a feeding device for slivers, comprising means located immediately upstream of the feeding device for transversely severing said sliver with a clean cut without altering the cross section of said sliver.

4,055,937

DOUBLE TWIST THREAD TWISTING FRAME

Hans Latus; Zdenek Hemala, both of Kempten; Heinz Bleeck, Probstried, and Rolf Dieter Weber, Kempten, all of Germany, assignors to Saurer-Allma GmbH Allgaeuer Maschinenbau, Kempten, Germany

Filed Sept. 27, 1976, Ser. No. 727,366
Claims priority, application Germany, Oct. 6, 1975, 7531678
Int. Cl.[2] D01H *1/10, 1/16, 11/00, 13/30*
U.S. Cl. 57—34 R 10 Claims



1. In a double twist thread twisting frame having a plurality of double twist spindles each of which is surrounded by a balloon limiter having an upper rim thereon and has at its lower part a storage disc and a whorl driven by a belt spaced below said storage disc, upper and lower closure wall means above and below, respectively, said balloon limiter and extending over the whole width and length of said frame, and on both sides of said frame, side wall means are arranged outside said balloon limiter and connected to said upper and lower closure wall means, channel means defined by said upper, lower and side wall means being in communication with said double twist spindles and the interior of said balloon limiters and having a suction device connected thereto, the improvement comprising wherein said upper closure wall means is arranged generally at the level of said upper rim of said balloon limiter and has in the region of each balloon limiter a coaxial circular opening therein, the diameter of said circular opening being somewhat smaller than the part of the balloon limiter located therebeneath, and wherein there is provided on said balloon limiter in the region below said upper closure wall means a suction opening communicating with said channel means, and wherein above each balloon limiter there is provided blower nozzle means connected to a tube that extends in the longitudinal direction of the frame for supplying conditioned air to said circular opening in said balloon limiter.

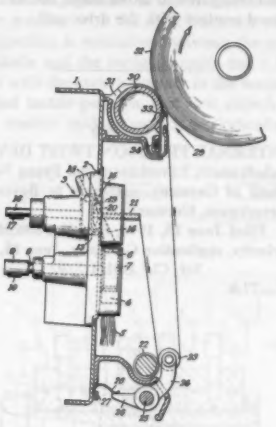
4,055,938

OPEN-END SPINNING

James William Barnes Clayton, Accrington, England, assignor to Platt Saco Lowell Limited, Rossendale, England

Filed Nov. 8, 1976, Ser. No. 739,807
Claims priority, application United Kingdom, Nov. 13, 1975, 46840/75
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.89 17 Claims

1. Apparatus for open-end spinning textile yarns, comprising a longitudinally extending machine frame, a plurality of spinning units mounted at spaced intervals along said machine frame, each said spinning unit including fibre feed means and spinning means for receiving fibres from the fibre feed means and spinning them into a tail end of yarn for continuously withdrawal of yarn from the spinning means, yarn withdrawal means for withdrawing the yarn along a yarn withdrawal axis to a yarn delivery aperture of the spinning means and forming the yarn into a package, said yarn withdrawal means comprising a package forming assembly for forming a package of the yarn and having yarn distributing means for distributing the yarn on the package and yarn engaging means to engage the yarn in its passage between the yarn delivering aperture and the yarn distributing means, wherein the yarn engaging means



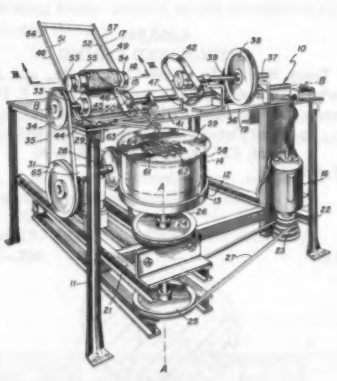
and the yarn distributing guide means are arranged on opposite sides of the spinning unit and wherein the distance travelled by the yarn from the yarn engaging means to the yarn distributing means is greater than the distance from the yarn delivery aperture to the yarn distributing guide means.

4,055,939

SPINNING MACHINE

Lawrence S. Bussiere, 49 Hagop Road, Salem, N.H. 03079

Filed Aug. 5, 1976, Ser. No. 712,036
Int. Cl.[2] D01H *11/00, 1/28*
U.S. Cl. 57—62 11 Claims



1. A spinning machine, comprising
a. a supporting structure,
b. a platform having a horizontal upper surface for receiving a roving cheese and supported on the structure for rotation about a vertical axis,
c. a drive roll mounted on the structure for rotation about a horizontal axis that is substantially spaced from the said vertical axis,
d. means driving the platform and the drive roll at selected relative speeds,
e. a rack element mounted on the structure and defining a plane, the plane lying parallel to and spaced from the said

horizontal axis, the plane lying at an acute angle to the said vertical axis, and

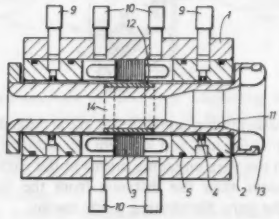
f. a receiving spool on which the yarn is coiled, the spool being carried on the rack for rotation about a horizontal axis parallel to and spaced from the said horizontal axis, the spool being free to move under the influence of gravity toward contact with the drive roll.

4,055,940

INTERNAL FRICTION TWIST DEVICE

Edgar Muschelknautz, Leverkusen, and Franz Nemecek, Duesseldorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 15, 1976, Ser. No. 696,300
Claims priority, application Germany, June 18, 1975, 2527004
Int. Cl.[2] D01H *7/92*
U.S. Cl. 57—77.4 **12 Claims**



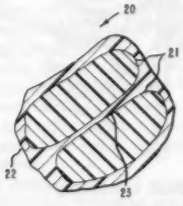
1. An internal friction twist device for texturing fine threads, comprising an air-supported twist device in the form of a component of the rotor of an electric motor.

4,055,941

INTEGRATED STRING

Joseph Tracy Rivers, Jr., West Chester, Pa., and Joe Dennis Zaharko, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 9, 1976, Ser. No. 748,883
Int. Cl.[2] D02G *3/34, 3/38, 3/40*
U.S. Cl. 57—149 **10 Claims**



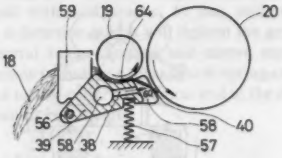
1. An integrated string comprised of from 2 to 4 monofilaments of an oriented, synthetic, thermoplastic polymer, with each monofilament having a denier of 2,000 to 8,000 and having at least two opposite flattened sides throughout its length, said monofilaments having substantially no individual twist and being ply-twisted and bonded together throughout the length of the string with each said monofilament being bonded along a flattened side to at least one other of said monofilaments.

4,055,942

METHOD FOR PIECING A THREAD ON OPEN-END SPINNING UNITS

Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, Germany

Filed Feb. 6, 1976, Ser. No. 655,853
Claims priority, application Germany, Feb. 19, 1975, 2507153
Int. Cl.[2] D01H *15/00*
U.S. Cl. 57—156 **18 Claims**



2. A method for piecing a thread on an open-end spinning unit of the type having a spinning rotor, comprising:

preparing shortened fibres,

supplying said shortened fibres to said spinning rotor to form a ring of shortened fibres,

returning a thread end to said ring of shortened fibres while rotating said spinning rotor to piece said thread end with said ring of shortened fibres,

drawing off said thread,

and supplying normal length fibres to said spinning rotor to form more thread following the piecing connection formed with said shortened ring of fibres,

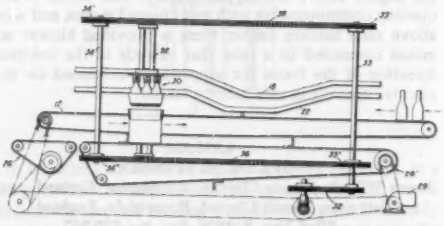
wherein said preparing and supplying of said shortened fibres are performed in a predetermined manner to form a predetermined configuration of said ring of shortened fibres, whereby uniform repetitive piecing operations are accommodated.

4,055,943

BOTTLE LOADING MACHINE

Donald G. Reichert, Tarpon Springs, Fla., assignor to ABC Packaging Machine Corporation, Tarpon Springs, Fla.

Filed June 9, 1976, Ser. No. 694,205
Int. Cl.[2] B65B *21/18*
U.S. Cl. 53—247 **20 Claims**



1. A machine for loading bottles into cases comprising, in combination, bottle conveyor means for continuously conveying upstanding bottles through a bottom retrieving station; grouping means for grouping together into a preselected arrangement a plurality of upstanding bottles on said bottle conveyor means; case conveyor means for continually conveying open cases through a case loading station; and gripper means for gripping and carrying a grouped plurality of upstanding bottles as they move through the botle retrieving station off of said bottle conveyor means and for subsequently depositing the gripped group of bottles into an open case as it passes through the case loading station upon said case conveyor means, said grouping means comprises a bottle retainer

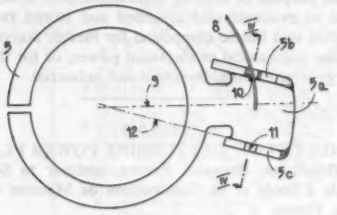
bar overlying said bottle conveyor means, and means for reciprocally moving said retainer bar over said bottle conveyor means.

4,055,944

SECURING DEVICE FOR THE OUTER END OF THE HAIR-SPRING OF A TIMEPIECE

Rene Widmer, Fontainemelon, Switzerland, assignor to Fabrique d'Horlogerie de Fontainemelon S.A., Fontainemelon, Switzerland

Filed May 24, 1976, Ser. No. 689,089
Claims priority, application Switzerland, June 18, 1975, 7900/75
Int. Cl.² G04B 17/32
U.S. Cl. 58—115 2 Claims



1. In a timepiece having a balance wheel, a hair-spring and a support therefor, a securing device for the outer end of said hair-spring comprising

a U-shaped arm extending radially of the axis of said balance wheel and having a pair of thin-walled ears disposed parallel to each other and to said axis, said ears being disposed at a predetermined angle to the radial plane through the middle of said arm,

one of said ears being provided with a first opening for receiving and fixing the outer end of said hair-spring by gluing it therein,

the other of said ears being provided with a second opening for receiving the end of said hair-spring and having a securing pin for fixing it is said second opening when it is not glued in said first opening,

said other ear being disposed on a radial plane through the axis of said balance wheel such that the plane of said second opening is perpendicular to the tangent to said hair-spring at the point where it is fixed by said pin.

4,055,945

FREQUENCY ADJUSTMENT MEANS FOR AN ELECTRONIC TIMEPIECE

Jack Schwarzschild, and John R. Lowdenslager, both of Stamford, Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Dec. 15, 1975, Ser. No. 640,665
Int. Cl.² G04B 27/08
U.S. Cl. 58—85.5 1 Claim

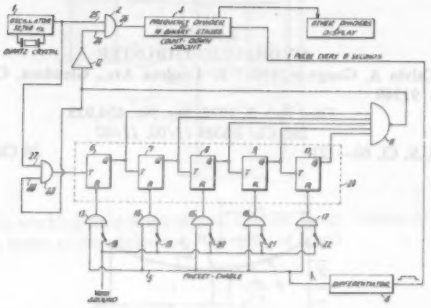
1. A horological instrument comprising:

a piezoelectric crystal oscillator;

a countdown circuit coupled to the oscillator to receive pulse signals from said oscillator and frequency divide said pulse signal down to a lower frequency output pulse signal;

means for periodically inhibiting at the countdown circuit at least a first or second predetermined number of pulse signals or the sum of the first and second predetermined number of pulse signals to further lower the frequency of the output pulse signal at said countdown circuit;

means including at least a first and second manually activatable switch each having an elongated shaft actuator having contoured portions to establish a first and second detented longitudinal tactile positions, a switch contact mounted for selective engagement with the shaft actuator, and single spring means common to said first and second manually activatable switches and having spring fingers in an arm of an energy cell spring in electrical contact with the shaft of each of said first and second manually activatable switches and engaging each shaft for providing detented longitudinal movement of each shaft to selectively enable a fixed engagement in the first detented longitudinal tactile position with the switch contact wherein electrical connection is maintained between the spring means and the shafts and the switch contact and a fixed disengagement with the switch contact in the second detented longitudinal tactile position, said first switch being activated to control said means for periodically inhibiting



pulse signals to inhibit the first predetermined number of pulse signals and deactivated to cease inhibiting the first predetermined number of pulse signals, said second switch being activated to control said means for periodically inhibiting pulse signals to inhibit the second predetermined number of pulse signals and deactivated to cease inhibiting the second predetermined number of pulse signals, and first and second switches both being activated to control said means for periodically inhibiting pulse signals to periodically inhibit the sum of the first and second predetermined number of pulse signals and;

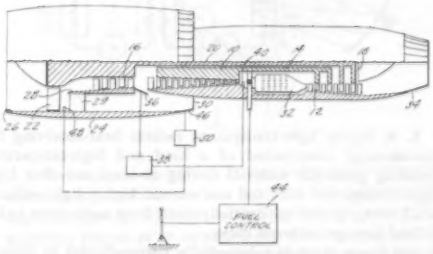
time indicating means coupled to the countdown circuit to be activated thereby.

4,055,946

TWIN-SPOOL GAS TURBINE POWER PLANT WITH MEANS TO SPILL COMPRESSOR INTERSTAGE AIRFLOW

William H. Sens, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 29, 1976, Ser. No. 671,517
Int. Cl.² F02K 3/06; F02C 3/06, 9/04, 9/14
U.S. Cl. 60—204 5 Claims



1. An aircraft twin spool gas turbine power plant having a high and low compressor,

and high and low turbine for driving said high and low compressors, respectively,

a combustor disposed between said compressors and said turbines for generating hot gases for driving said turbines,

fuel control means for regulating the flow of fuel to said combustor so as to operate said high compressor said high compressor at a predetermined speed and compression ratio,

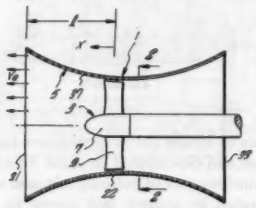
means for controlling the high compressor inlet pressure by spilling air exhausting from said low compressor such that at all aircraft altitudes, when the compressor operates at said predetermined rotational speed and compression ratio, the compressor discharge pressure and temperature are substantially the same for all conditions of said power plant over the flight envelope of the aircraft.

4,055,947

HYDRAULIC THRUSTER

Calvin A. Gongwer, 19017 E. Leadora Ave., Glendora, Calif. 91740

Filed Feb. 3, 1976, Ser. No. 654,925
Int. Cl.² B63H *11/00, 11/02*
U.S. Cl. 60—221 **26 Claims**



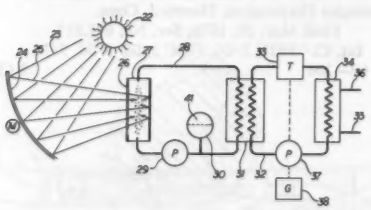
1. A thruster comprising an impeller positioned with a diffuser throat, said impeller having at least one blade mounted about a central rotatable hub wherein the chord of said blade root and tip sections is greater than the chord of said blade midsection, and said impeller blade is further defined as having a greater pitch at said tip section than at said blade midsection.

4,055,948

SOLAR THERMAL-RADIATION, ABSORPTION AND CONVERSION SYSTEM

Robert A. Kraus, and Edmund J. Kraus, both of 14160 Redhill, Tustin, Calif. 92680

Filed Dec. 8, 1975, Ser. No. 638,927
Int. Cl.² F03G *7/02*; F24J *3/02*
U.S. Cl. 60—641 **5 Claims**



1. A highly light-transparent radiant heat-receiving fluid containment constructed of a hard and high-temperature-resisting glass-like material having at least one first highly light-transparent wall and one second highly light-reflecting wall, being spaced substantially apart from each other to form a fluid passage between them

and being exposed substantially perpendicular to direct or indirect and focused thermal radiant emission from the sun,

comprising a temperature-inert, thermal radiation-absorbing fluidic heat-transfer compound of a certain desired optical density, having a high boiling point and comprising a quantitative magnitude of solid, dull-black, non-light-reflecting particles of colloidal size, per unit area, times a certain unit fluid depth to compliment said fluidic compound's desired optical density and being homogeneously suspended within said heat-transfer fluid, circulating through said transparent radiation receiver containment

to be heated directly from within through the basic heat-transfer process of radiation,

wherein the thermal radiation emitted from the sun penetrates through said transparent radiation receiver containment to strike those particles of colloidal size suspended homogeneously within said circulating, radiant heat-absorbing, heat-transfer fluid, partially direct and partially by means of reflection from said second light-reflecting wall

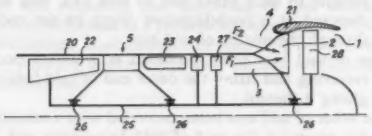
for the purpose of heating that radiant heat-absorbing fluid and to evacuate said absorbed and stored radiant heat within said fluidic compound for further conversion into either mechanical or electrical power, or for the purpose of general heating, domestic and industrial.

4,055,949

MULTIFLOW GAS TURBINE POWER PLANT

Serge Boudigues, Bagneux, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Division of Ser. No. 467,793, May 7, 1974, Pat. No. 3,968,647.
This application May 3, 1976, Ser. No. 682,523
Claims priority, application France, May 8, 1973, 73.16471
Int. Cl.² F02C *3/06*; F02K *3/04*
U.S. Cl. 60—269 **6 Claims**



1. A dual-flow gas-turbine jet propulsion engine of the kind subdivided into a primary duct and a secondary duct traversed in operation respectively by a primary gas flow and by a secondary air flow, comprising in combination:

a. a gas generator of the internal-combustion gas-turbine type including compressor means, combustion means and turbine means mounted in series flow arrangement in said primary duct, said gas generator being designed to deliver a gas flow at a first pressure which is higher than the pressure of said secondary air flow through said secondary duct,

b. a super-expansion turbine separate and distinct from said turbine means and located in said primary duct downstream of said turbine means to receive the primary gas flow from said gas generator and super-expand the same from its initial pressure down to a lower pressure substantially equal to that of said secondary air flow,

c. flow-mixer means communicating both with said primary duct downstream of said super-expansion turbine and with said secondary duct, for intermingling said super-extended gas flow with said secondary air flow at their substantially equal pressure, to deliver a gaseous mixture of said gas and said air,

d. a recompressor arranged downstream of said flow-mixer means to be supplied in operation with said gaseous mixture and raise the same to a higher pressure,

e. drive means interconnecting said recompressor and said super-expansion turbine for driving said recompressor from said super-expansion turbine, and

f. a jet propulsion nozzle extending downstream of said recompressor to be supplied with said recompressed gase-

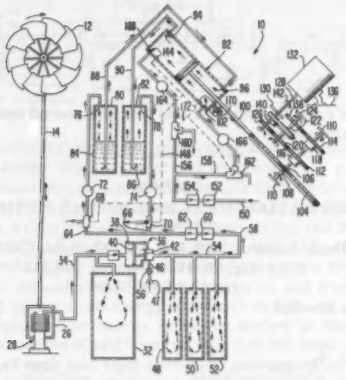
ous mixture issuing therefrom, and discharge a thrust-producing jet.

4,055,950

ENERGY CONVERSION SYSTEM USING WINDMILL

William C. Grossman, 4274 Briarwood Way, Palo Alto, Calif. 94303

Filed Dec. 29, 1975, Ser. No. 644,495
Int. Cl.[2] F16D *31/02*
U.S. Cl. 60—398 2 Claims



1. An energy transfer system comprising: a rotatable windmill responsive to atmospheric wind; an air compressor coupled to the windmill for compressing air as a function of the rotation thereof under the influence of atmospheric wind; means coupled with the compressor for storing air compressed thereby; a prime mover including a piston and cylinder assembly, said piston of the assembly having a control rod responsive to a fluid under pressure, there being a rack on the control rod, and structure coupled to the rack for connecting the same to a workproducing apparatus; a hydraulic motor having a pair of tanks containing a liquid, said tanks being coupled to said prime mover for supplying liquid thereto to thereby actuate said control rod and to maintain it in operation in response to a change in the level of the liquid in said tanks to thereby permit said prime mover to operate said work-producing apparatus, said storing means being in fluid communication with said tanks to supply compressed air thereto for changing said liquid level therein; and a valve responsive to the operation of the prime mover for controlling the flow of compressed air from said storing means into and out of each tank, respectively.

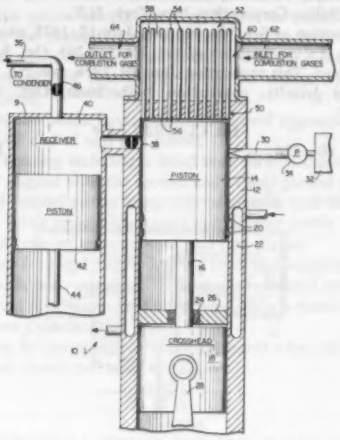
4,055,951

CONDENSING VAPOR HEAT ENGINE WITH TWO-PHASE COMPRESSION AND CONSTANT VOLUME SUPERHEATING

John Gordon Davoud, and Jerry Allen Burke, Jr., both of Richmond, Va., assignors to D-Cycle Associates, Richmond, Va.

Filed Aug. 16, 1976, Ser. No. 714,513
Int. Cl.[2] F01K *21/02*
U.S. Cl. 60—514 9 Claims

1. A heat engine power producing cycle using a condensable vapor as the working fluid characterized in that the heat input is indirectly into the working fluid of the engine in a zone comprising the clearance volume of the cylinder and wherein



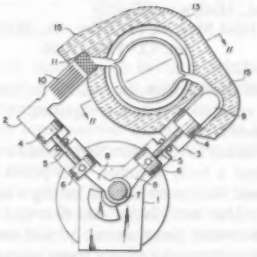
the working fluid is introduced into the swept volume of the cylinder of the engine as a fine spray of liquid.

4,055,952

HEATING DEVICE FOR AN EXTERNAL COMBUSTION ENGINE

Lennart Nils Johansson, Eskilstuna, and Claes-Goran O. Svensson, Borensberg, both of Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Nov. 11, 1975, Ser. No. 631,121
Int. Cl.[2] F02G *1/04*
U.S. Cl. 60—517 2 Claims

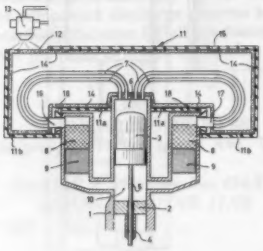


1. An external combustion two cylinder engine arrangement comprising in combustion, a separate low temperature and high temperature cylinder with a cylindrical heater head of arcuately shaped pipes arranged therebetween, and a cylindrical combustion chamber surrounded by a recuperative heat exchanger comprises a single unit mounted abutting one end of said cylindrical heater head to permit removal as a unit.

4,055,953
HOT-GAS RECIPROCATING ENGINE

Anton Marie Nederlof, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 596,186, July 15, 1975, abandoned, which is a continuation of Ser. No. 513,241, Oct. 9, 1974, abandoned. This application June 29, 1976, Ser. No. 700,750
Claims priority, application Netherlands, Oct. 31, 1973, 7314928
Int. Cl.[2] F02G 1/04
U.S. Cl. 60—526 10 Claims



2. In a hot gas engine including a housing, a regenerator, a cylinder and displacer defining together a variable-volume expansion space, a heater comprising a heater duct having first and second ends communicating with said expansion space and said regenerator respectively, and a heat pipe generally surrounding said heater duct for supplying thermal energy thereto, the improvement in combination therewith, wherein said cylinder and displacer component has a central axis along which the displacer is reciprocated, and said regenerator component has a central axis corresponding to the flow direction of fluid therethrough, and said improvement comprises a tubular connection member oriented transverse of the central axis of at least one of said components and engaging and interconnecting said component and one of said heater duct ends, said member traversing said heat pipe wall with a clearance space defined therebetween, said improvement further comprising flexible seal means sealing said clearance space, whereby, a continuous fluid path is provided between said expansion space and said regenerator through said heater duct and connection member.

4,055,954
DAMPER ACTUATOR FOR A VENTILATION SYSTEM

Ronald Aaron Marks, Canoga Park; George Levenback, Studio City, and Albert Sweet, Northridge, all of Calif., assignors to Elster's Inc., Hollywood, Calif.

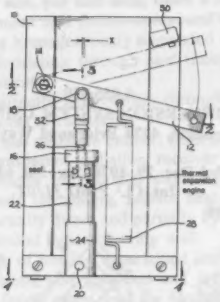
Filed May 30, 1975, Ser. No. 582,090
Int. Cl.[2] F03G 7/06
U.S. Cl. 60—527 10 Claims

1. In a ventilation system, an actuator to control the flow of fluid in said ventilation system comprising:

a frame assembly;

an engine means having a first and second end, and having a piston and a body member, said piston being movable within said body member and having a seal between said body member and piston, said first end being rotatably coupled to said frame assembly, said second end being movable with respect to said frame assembly, said engine means for applying a force by displacing said second end with respect to said first end in response to a signal activating said engine means; and

a lever means being rotatably coupled to said frame assembly, said second end of said engine means being rotatably coupled to said lever means, for delivering said force from said engine means to control flow of fluid within said ventilation system, said rotatable couplings of said first and second ends of said engine means substantially reducing stresses on said seal in a direction perpendicular to an

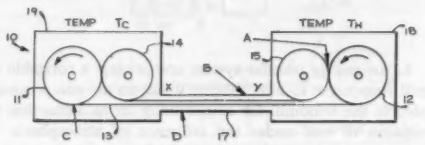


axis extending through said first and second ends of said engine means.

4,055,955
MEMORY ALLOY HEAT ENGINE AND METHOD OF OPERATION

Alfred Davis Johnson, 2108 41st Ave., Oakland, Calif. 94601

Filed Aug. 16, 1976, Ser. No. 714,344
Int. Cl.[2] F03G 7/06
U.S. Cl. 60—527 25 Claims



1. A method of converting thermal energy into mechanical work by means of a heat source, a heat sink, and a memory alloy which is characterized in having a transition temperature at which crystal phase transformation occurs, including the steps of cooling a portion of the alloy in the heat sink below said transition temperature whereby the cooled portion assumes a first configuration, moving the cooled portion along a first path from the heat sink to the heat source, heating a portion of the alloy in the heat source above said transition temperature whereby the heated portion assumes another configuration, causing the heated alloy portion to apply a force through a distance as it changes from the first to the second configuration to perform said mechanical work, and moving the heated portion of the alloy along another path in heat exchange relationship with the alloy portion in the first path whereby thermal energy from the heated portion is transferred to the cooled portion for maximizing the efficiency of conversion of thermal energy in the heat source into said mechanical work.

8. A method for starting operation of a heat engine employing a shape memory alloy formed in an endless loop one end of which is reeved in non-slip engagement about a first pulley and the second end of which is reeved in non-slip engagement about a second pulley having a diameter greater than the diameter of the first pulley, the method of starting operation comprising the steps of applying heat to a portion of the wire reeved about the first pulley, extracting heat from a portion of the wire reeved about the second pulley, applying a torque to the pulleys so that they conjointly turn at equal angular rates and in the same rotational direction for moving the loop through at least one complete cycle around the pulleys, progressively applying tension in the loop as the loop continues to

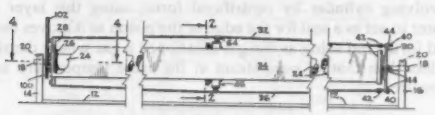
cycle about the pulleys, and removing the applied torque when the torque generated by the engine is sufficient to rotate the pulleys.

4,055,956

HIGH TORQUE SOLAR MOTOR

Mitchel J. Matovich, Jr., 19354 Zinfandel Court, Saratoga, Calif. 95070

Continuation-in-part of Ser. No. 639,845, Dec. 11, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,607
Int. Cl.² F03G *7/02*
U.S. Cl. 60—527 **10 Claims**



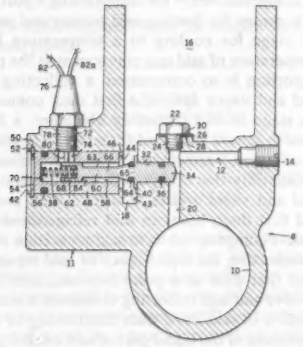
1. A motor for converting to mechanical energy heat energy which radiates from a source and travels along a path, said motor comprising a base, a non-rotatable shaft secured to said base for defining an axis of rotation oriented transversely of said path, a rigid frame and means for supporting said frame for rotation on said shaft, first and second thin elongate vanes having ends rigidly fixed to said frame, said vanes being supported at circumferentially spaced points on said frame, each said vane having a heat energy absorbtive surface and an oppositely disposed heat energy reflective surface so that in response to rotation of said frame on said shaft the respective said surfaces of each said vane alternately and sequentially move through an exposed position at which the vane surfaces are exposed to said source, said vanes being formed of material having a thermal coefficient of expansion and contraction so that upon movement of the absorbtive surfaces of respective said vanes to a position nonexposed to said source said vanes contract to produce a tensile force, means interlinking said vanes at a site substantially medially of said ends and said shaft for converting said tensile force to a rotational force on said frame, and output means connected to said frame.

4,055,957

AUTOMOTIVE BRAKE FLUID LOW-LEVEL WARNING SENSOR

Edward J. Falk, St. Louis County, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Feb. 17, 1976, Ser. No. 658,771
Int. Cl.² F15B *7/00*
U.S. Cl. 60—535 **12 Claims**



9. A warning sensor for a hydraulic brake system including a housing having a master brake cylinder with brake fluid therein and a reservoir containing a supply of brake fluid comprising:

a. a first piston having one end thereof in communication with the brake fluid of said master cylinder to apply a force against said one end of the first piston causing translation of said first piston when the master cylinder is actuated;

b. a second piston having one end thereof connected to the second end of said first piston;

c. the housing including a blind bore formed therein coaxially aligned with the second end of said second piston;

d. said second piston being located outside said blind bore and being translated toward and at least partly into said blind bore by translation of said first piston;

e. means for supplying brake fluid from said reservoir to said blind bore to oppose movement of the second end of said second piston into said blind bore upon actuation of the master cylinder; and

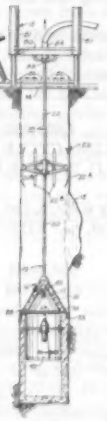
f. means for generating an electrical signal when said second piston enters said blind bore.

4,055,958

SLIPFORMING METHOD AND APPARATUS FOR IN SITU LINING OF AN UPWARDLY OPEN SHAFT WITH MONOLITHIC CONCRETE

Raymond A. Hanson, P.O. Box 7400, Spokane, Wash. 99207

Filed Sept. 20, 1976, Ser. No. 724,655
Int. Cl.² E21B *33/13*
U.S. Cl. 61—41 R **13 Claims**



1. In a slipform assembly for lining in situ an upright upwardly open vertical walled shaft with monolithic concrete, a combination comprising:

a conical outer form member having an open lower end;

an upwardly closed inner core member mounted to the outer form member;

said inner core member having an upright wall spaced inwardly from the open lower end of the outer form member;

sectioned tremmie tube means openly connected at a lower end to the outer core member for supporting the outer form and inner core members within the shaft and for receiving concrete at an upper end and directing the concrete downwardly between the outer form and inner core members;

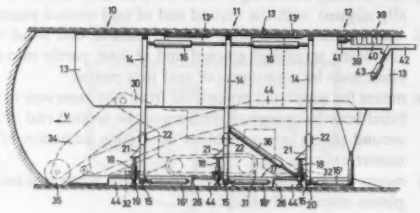
guide means on the tremmie tube for centering the outer form and inner core members in a shaft; and

concrete supply means removably connected to the tremmie tube at its upper end for supplying fluid concrete to the tremmie tube.

4,055,959
APPARATUS FOR USE IN MINING OR TUNNELLING INSTALLATIONS

Giselher Fritz, Werne, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Nov. 29, 1976, Ser. No. 745,748
Claims priority, application Germany, Dec. 2, 1975, 2554107
Int. Cl.[2] E01G 3/02
U.S. Cl. 61—85 24 Claims



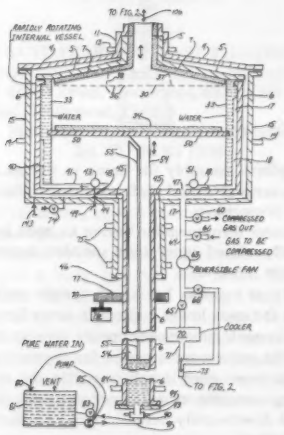
1. Apparatus for supporting and shielding excavation machinery for use in mining or tunnelling operations, said apparatus comprising:
   a. a floor sill for supporting said machinery;
   b. a shield for shielding said machinery, said shield being constituted by a plurality of generally cylindrical shield sections;
   c. means for advancing said shield whilst said floor sill remains stationary; and
   d. means for advancing said floor sill whilst said shield remains stationary;

whereby, during operation, said shield is advanced relative to said floor sill and then subsequently, said floor sill is drawn up to follow the advancement of said shield.

4,055,960
STIRLING CYCLE ENGINE

John Craig St. Clair, P.O. Box 3345, University Station, Columbus, Ohio 43210

Filed July 6, 1976, Ser. No. 702,417
Int. Cl.[2] F25B 9/00
U.S. Cl. 62—6 11 Claims

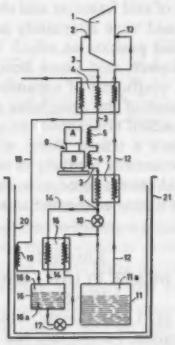


1. A process for compressing a gas with a lower molecular weight than water by means of Stirling Cycle which comprises: storing a hot gas and a cold gas of the same composition but in separate compartments with both under approximately the same pressure in a cylinder with the cold and hot gases being separated by a moveable piston, removing cold gas from the cylinder and heating it and introducing the heated cold gas into the end of the cylinder with the hot gas, thus moving the piston and thus increasing the pressure of the hot and cold gas stored, removing gas at increased pressure from the system as a product, reversing the above process with hot gas being removed from the hot gas storage in the cylinder and cooling it and introducing it into the end of the cylinder with the cold gas, thus moving the piston in the opposite direction to that previously obtained and thus decreasing the pressure of the cold and hot gas stored, and introducing gas to be compressed into the system, the novelty comprising revolving the cylinder that stores the hot and cold gases around its longitudinal axis, maintaining a layer of water around the inner surface of the revolving cylinder by centrifugal force, using this layer of water to act as a seal for the edge of the piston as it moves back and forth, and using as the gas mentioned a gas whose density is less than that of pure steam at the same temperature and pressure.

4,055,961
DEVICE FOR LIQUEFYING GASES

Petrus Simon Admiraal, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 494,393, Aug. 5, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,106
Claims priority, application Netherlands, Aug. 21, 1973, 7311471
Int. Cl.[2] F17C 13/00
U.S. Cl. 62—54 3 Claims



1. Apparatus for selectively liquifying one component contained in a gaseous body comprising no more than two components which comprises means for compressing a portion of said gaseous body, means for feeding said pressurized portion to a refrigeration stage for cooling to a temperature below the inversion temperature of said one component at the pressure to which said portion is so compressed, a collecting container having liquid and vapor spaces, a first duct connecting said refrigeration stage to said collecting container, a first Joule-Thompson valve in said first duct for selectively reducing the pressure of said cooled pressurized portion when said gaseous body comprises only one component, a separation container having liquid and vapor spaces, a second duct connecting a point of said first duct, between said refrigeration stage and said first Joule-Thompson valve, to said separation container, a third duct connecting the liquid space of said separation container to said first duct at a point between said first Joule-Thompson valve and said collecting container, a second Joule-Thompson valve in said third duct functioning to selectively reduce the pressure of the liquid part of said cooled pressurized portion when said gaseous body comprises two components, means to exchange heat in counterflow relationship between said second duct and a section of said third duct between said

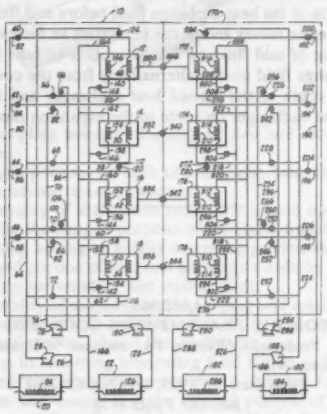
second Joule-Thompson valve and said first duct, and a fourth duct connecting the vapor space of the collecting container to said compressing means, for feeding vapor from said vapor space to said compressing means.

4,055,962

HYDROGEN-HYDRIDE ABSORPTION SYSTEMS AND METHODS FOR REFRIGERATION AND HEAT PUMP CYCLES

Lynn E. Terry, 22 Suncrest Ave., Bridgeton, N.J. 08302

Filed Aug. 18, 1976, Ser. No. 715,231
Int. Cl.[2] F25B *15/00;* **F01K** *25/10*
U.S. Cl. 62—102 **17 Claims**



1. An absorption system comprising:

a first hydride-dehydride subsystem including first reactor means;

a first hydridable material in said first reactor means for forming a first hydride by reaction with hydrogen gas;

a second hydride-dehydride subsystem including second reactor means;

a second hydridable material in said second reactor means for forming a second hydride by reaction with hydrogen gas;

means for periodically transferring hydrogen gas between said first and second reactor means;

means for supplying heat to said first reactor means and said second reactor means in alternating sequence for effecting chemical compression and dehydriding of the hydrides of said first and second hydridable materials;

means for recovering a part of the thermal energy from said first and second reactor means in each of said subsystems; and

means for removing heat from the reactor means in each of said subsystems.

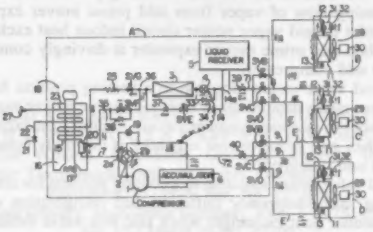
4,055,963

HEATING SYSTEM

Kunihiro Shoji; Akihiro Yokota, and Kenzo Watanabe, all of Kusatsu, Japan, assignors to Daikin Kogyo Co., Ltd., Japan

Filed June 25, 1975, Ser. No. 590,203
Int. Cl.[2] F25B *13/00*
U.S. Cl. 62—238 **12 Claims**

1. An air conditioning system comprising compressor means **(1)** having suction side and delivery side; four-way valve means **(2)** having a first port connected to the suction side, a second port connected to the delivery side, a third port and a fourth port, heat exchanger means **(15)** for heating refrigerant passing therethrough by a heat source which is higher in temperature than outdoor air, connected to said third port of said four-way valve means **(2)**; outdoor coil means **(3)** connected to said heat exchanger means **(15)**, check valve means **(34)** connected to said outdoor coil means **(3)** permitting the refrigerant to flow from said outdoor coil means **(3)**, expansion means **(12)** for cooling operation connected to said check valve mean **(34)**, indoor coil means **(11)** connected to said expansion **(12)** and said fourth port of said four-way valve means **(2)**, first bypass circuit means **(31)** bypassing said expansion means **(12)** and having check valve means **(37)** permitting the refrigerant to flow from said indoor coil means **(11)**, second bypass circuit means **(14)** bypassing said outdoor coil means **(3)** and said check valve means **(34)** and having check valve means **(37)** permitting the refrigerant to flow from said indoor coil means **(11)** to said heat exchange means **(15)**, fourth bypass circuit means **(35)** bypassing said heat exchanger means **(15)** and having check valve means **(38)** permitting the refrigerant to flow from said four-way valve means to said outdoor coil means **(3)**, whereby by operating said four-way valve means **(2)** said system can selectively make a cooling circuit for cooling operation wherein refrigerant flows from said compressor means **(1)** through said four-way valve means **(2)**, fourth bypass circuit means **(35)**, outdoor coil means **(3)**, check valve means **(34)**, expansion means **(12)**, said indoor coil means **(11)**, and four-way valve means **(2)** in the indicated order, to said compressor means **(1)**, or a heating circuit for heating operation wherein said refrigerant flows from said compressor means **(1)** through said four-way valve means **(2)**, indoor coil means **(11)**, first bypass circuit means **(31)**, second bypass circuit **(14)**, heat exchanger means **(15)** and four-way valve means **(2)**, in the indicated order, to said compressor means **(1)**.

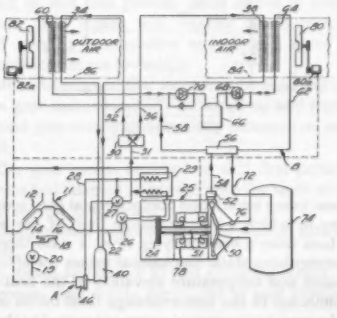


4,055,964

HEAT PUMP SYSTEM

Paul F. Swenson, Cleveland, Ohio, and Paul B. Moore, Fedhaven, Fla., assignors to Consolidated Natural Gas Service Company, Cleveland, Ohio

Filed Nov. 1, 1976, Ser. No. 737,776
Int. Cl.[2] F25B *27/02, 13/00, 1/00*
U.S. Cl. 62—238 **15 Claims**



1. A fluid heating and cooling system comprising:

a refrigeration circuit having a compressor with an inlet and an outlet, an indoor refrigeration circuit heat exchanger, and an outdoor refrigeration circuit heat exchanger,

a vapor power circuit having a vapor generator with an inlet and an outlet, a prime mover expander having an inlet and an outlet, means connecting said vapor generator outlet with said prime mover expander inlet, an indoor vapor power circuit heat exchanger, an outdoor vapor power circuit heat exchanger,

first fluid moving means for conducting a first fluid in series across both of said indoor heat exchangers,

second fluid moving means for conducting a second fluid in series across both of said outdoor heat exchangers,

means for drivingly interconnecting said prime mover expander with said compressor,

first valve means movable to a cooling position for discontinuing flow of vapor from said prime mover expander outlet to said vapor power circuit indoor heat exchanger when said prime mover expander is drivingly connected to said compressor,

second valve means movable to a heating position for discontinuing flow of vapor from said prime mover expander outlet to said vapor power circuit outdoor heat exchanger when said prime mover expander is drivingly connected to said compressor,

third valve means movable to a cooling position for connecting said compressor outlet to said refrigeration circuit outdoor heat exchanger when said first valve means is in said cooling position,

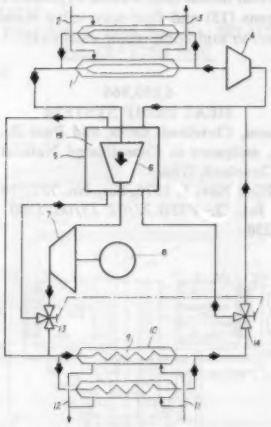
fourth valve means movable to a heating position for connecting said compressor outlet to said refrigeration circuit indoor heat exchanger when said second valve means is in said heating position.

4,055,965

HEAT PUMP INSTALLATION

Edmond Girard, Boulogne, France, assignor to Society Messier, Paris, France

Filed Sept. 8, 1976, Ser. No. 721,588
Int. Cl.[2] F25B *13/00, 1/10*
U.S. Cl. 62—324 10 Claims



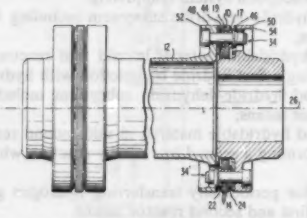
1. A heat pump installation comprising: at least one first heat exchanger in which a heat-exchange fluid of the installation absorbs heat from a heat-carrying fluid; a stato-thermic compressor comprising static mechanical means for effecting precompression and temperature elevation of the heat-exchange fluid, connected to the heat-exchange fluid outlet of the first heat exchanger; a compressor means connected to the outlet of the stato-thermic compressor, for compression of the heat-exchange fluid issuing therefrom; a second heat exchanger in which the heat-exchange fluid transfers heat to a working circuit which, in use, is connected to the installation; an expansion means connected to the heat-exchange fluid outlet on the second heat exchanger, for return of the fluid to the first heat exchanger; a first three-way valve in the connection between the outlet of the compressor means and the second heat exchanger, for diverting heat-exchange fluid from the compressor means to the second heat exchanger indirectly through the stato-thermic compressor; and a second three-way valve in the connection between the heat-exchange fluid outlet of the second heat exchanger and the expansion means, for diverting the heat-exchange fluid from the second heat exchanger to the expansion means indirectly through the stato-thermic compressor whereby the stato-thermic compressor effects precompression of the heat-exchange fluid before said fluid enters the compressor means and at the same time an increase in the temperature of said fluid by the absorption of heat from the heat-exchange fluid issuing alternatively from the compressor means on route to the second heat exchanger and from the second heat exchanger on route to the expansion means.

4,055,966

TORQUE TRANSMISSION COUPLING

Walter A. Fredericks, Warren, Pa., assignor to Rexnord, Inc., Milwaukee, Wis.

Filed Oct. 10, 1975, Ser. No. 621,450
Int. Cl.[2] F16D *3/78*
U.S. Cl. 64—13 46 Claims



1. A coupling for transmitting rotary power, said coupling comprising:

a. a plurality of flexible laminar elements;

b. first means for holding said laminar elements in facing relationship, thereby creating a coupling flexing element having a coupling axis and two axial faces;

c. a first pilot ring alignment means having at least one precision-finished readially symmetric surface for aligning said coupling flexing element with a first hub;

d. second means for affixing said first pilot ring to a first axial face of said coupling flexing element such that the axis of the precision-finished radially symmetric surface is coincident with the coupling axis;

e. said first hub being integral with or adapted to be connected to a shaft for the transmission of rotary power and having at least one precision-finished radially symmetric surface that axis of which is at least approximately coincident with the coupling axis and which is dimensioned to complement precision-finished radially symmetric surface on said first pilot ring; and

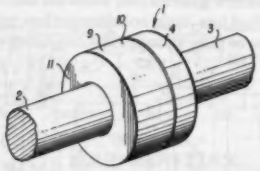
f. third means for mounting said coupling flexing element on said first hub.

4,055,967

AXIAL MOVEMENT LIMITING COUPLING ASSEMBLY

Carmen S. Terranova, and Rustam B. Chinoy, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,522
Int. Cl.[2] F16D 9/00
U.S. Cl. 64—28 R 2 Claims



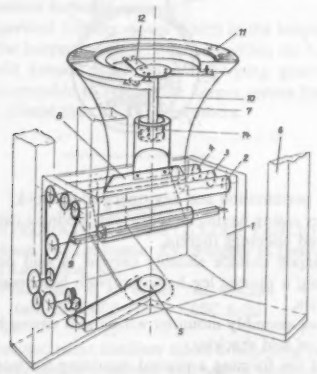
1. A coupling assembly for aligned first and second shafts comprising:
   a. flanged portions on each of said shafts, said flanged portions having openings therein;
   b. a plurality of shear bolts receivable in said openings for joining the flanged portions of the shafts together;
   c. a casing having an axially extending portion abutting the flanged portion of said first shaft and a radially extending portion surrounding said second shaft;
   d. a plurality of assembly bolts engaging said axially extending portion of said casing for assembling said casing to the flanged portion of said first shaft; and
   e. means for retaining lubricating fluid within said coupling assembly, said means comprising a chamber formed between said casing and the flanged portion of said first shaft, a gasket disposed between said axially extending portion of said casing and the flanged portion of said first shaft, and a seal disposed between said radially extending portion of said casing and said second shaft.

4,055,968

DRIVE ARRANGEMENT FOR WIND-UP APPARATUS IN A CIRCULAR KNITTING MACHINE

Norbert Paul Bourgeois, Troyes, France, assignor to A.S.A. S.A., Roanne, France

Filed Sept. 27, 1976, Ser. No. 726,954
Claims priority, application France, Oct. 1, 1975, 75.30070
Int. Cl.[2] D04B 15/88
U.S. Cl. 66—151 5 Claims



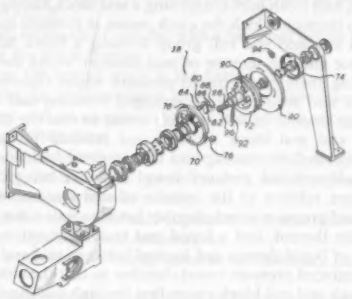
1. A circular knitting machine comprising needle beds adapted to produce a knitted tube, a cloth expander located, in use of the machine, within the knitted tube and a rotary wind up apparatus, such apparatus comprising at least two rollers mounted in a rotatable frame, said machine including means to rotate said rotary wind up apparatus, such means being adapted to act on said two rollers and being located, in use of the machine, within the knitted tube and being supported beneath the expander, said expander being supported by a shaft attached to one needle bed of the machine, and a shock absorber located between said shaft and said expander.

4,055,969

METHOD AND APPARATUS FOR PRODUCING TERRY CLOTH TOWELING ON A WARP KNITTING MACHINE

Christian Wilkens, Offenbach, Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Germany

Filed Sept. 27, 1976, Ser. No. 727,073
Claims priority, application Germany, Oct. 1, 1975, 2543714
Int. Cl.[2] D04B 23/00, 27/00
U.S. Cl. 66—204 31 Claims

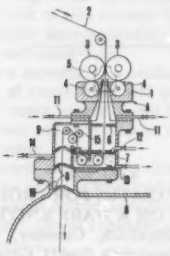


1. An apparatus for producing terry cloth toweling on a warp knitting machine comprising:
   a plurality of needles;
   a first and a second rotatable pattern chain means;
   a guide bar means including a plurality of guide bars for knitting on said needles, said guide bar means being responsive to the motion of said first pattern chain means;
   a transfer means for transferring some of the rotational motion of said first pattern chain means to said second pattern chain means, said transfer means comprising a speed varying transmission means, said speed varying transmission means including:
      a shaft on which said first pattern chain means is mounted;
      a first gear means coaxially mounted on said shaft;
      a second gear means also coaxially mounted on said shaft; and,
      an idler gear means attached to said first pattern chain means and adapted to engage with the teeth of said first and second gear means;
   an actuating means responsive to said second pattern chain means;
   a clutch means responsive to said actuating means;
   a cam means operatively connected to said clutch means; and,
   a guide bar moving means responsive to said cam means for moving one of said guide bars in response to the movement of said cam means.

4,055,970
HIGH TEMPERATURE AND HIGH PRESSURE STEAMER

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Apr. 13, 1976, Ser. No. 676,401
Claims priority, application Japan, Apr. 22, 1975, 50-48771
Int. Cl.[2] D06B *23/18*
U.S. Cl. 68—5 E 1 Claim



1. A high temperature and high pressure steamer for liquid processing cloth comprising a high temperature and high pressure steamer vessel body having a cloth inlet and a cloth outlet, said cloth inlet comprising a seal block having a seal roll group through which the cloth passes as it enters said steamer vessel and said seal roll group forming a block between the exterior and the interior of said steamer vessel for the cloth entering therein, a reduced pressure vessel chamber located within said steamer vessel arranged between said seal block and the interior of said steamer vessel so that the cloth passes from said seal block through said reduced pressure vessel chamber before entering into the interior of said steamer vessel, said reduced pressure vessel chamber being reduced in pressure relative to the interior of said steamer vessel, said reduced pressure vessel chamber having a valve seat within the interior thereof, and a liquid seal tank arranged to contain a body of liquid therein and located between said seal block and said reduced pressure vessel chamber so that the cloth entering through said seal block passes first through said liquid seal tank traversing the body of liquid therein and then enters said reduced pressure vessel chamber before entering the interior of said vessel, and said liquid seal tank having a liquid supply tube and liquid exhaust tube for introducing liquid into and removing liquid from said tank.

4,055,971
CLOSED CYCLE APPARATUS FOR THE RAPID, CONTINUOUS AND WATERLESS DYEING OF TEXTILE AND PLASTIC MATERIALS

Julius Hermes, Martinsville, Va., assignor to Martin Processing, Inc., Martinsville, Va.

Filed Aug. 10, 1976, Ser. No. 713,259
Int. Cl.[2] D06B *9/06*
U.S. Cl. 68—9 38 Claims

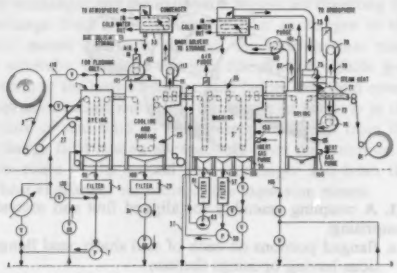
1. A closed cycle apparatus for the rapid, continuous and waterless dyeing of a generally continuous textile or plastic material with a dye comprising dyestuff dissolved or suspended or dispersed in a high boiling organic liquid which is free or substantially free of water and at a relatively high temperature comprising:

a dyeing apparatus for dyeing the textile or plastic material and recycling the used dye to the dyeing apparatus;

means for cooling and padding the dyed textile or plastic material and condensing vapors from the hot residual high boiling organic liquid and returning the vapors to said dyeing apparatus and returning the residual used dye to said dyeing apparatus;

means for washing the dyed textile or plastic material with a low boiling organic liquid which is free or substantially free of water and separating the used wash liquor from the residual high boiling organic liquid and residual dyestuff and returning said used wash liquor to the washing means and residual high boiling liquid and residual dyestuff to said dyeing apparatus, respectively;

means for drying the dyed and washed textile or plastic material and condensing vapors from the used residual low boiling organic liquid and returning said vapors to said washing means;



said dyeing apparatus, said means for cooling and padding, said means for washing, and said means for drying being arranged in series;

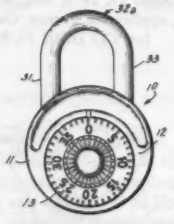
means for conveying the textile or plastic material successively through said dyeing apparatus, said means for cooling and padding, said means for washing, and said means for drying; and

means for taking-up the dyed, washed and dried textile or plastic material.

4,055,972
COMBINATION-CONTROLLED AND KEY-OPERATED SECURITY PADLOCK

Everett L. Calegan, Homewood, Ill., assignor to Junkunc Bros. American Lock Company, Crete, Ill.

Filed June 1, 1976, Ser. No. 691,864
Int. Cl.[2] E05B *37/06*
U.S. Cl. 70—21 11 Claims



1. In a permutation and key-operated padlock,

an outer casing having an outer wall having a pair of parallel spaced openings therein,

a U-shaped shackle slidably carried in said openings and having a shorter leg having a latch bolt receiving notch therein,

a rocker assembly mounted within said casing between the legs of said shackle,

a pivot pin forming a pivotal mounting for said rocker assembly,

a latch bolt slidably carried in said rocker assembly,

a spring seated in said rocker assembly and biasing said latch bolt to engage said latch bolt receiving notch,

permutation-controlled release means for said latch bolt to

accommodate release of said latch bolt from said shackle upon outward pulling movement on said shackle,

spring means biasing said rocker to position said latch bolt into a latching position upon release of said shackle and key-operated means engageable with said latch bolt to release said latch bolt from said shackle independently of said permutation-controlled release means,

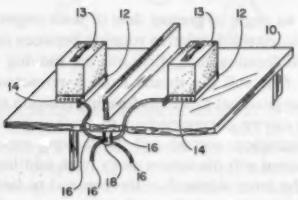
a two-part inner back plate closing said casing, one part forming a mounting for one end of said pivot shaft for said rocker and the other part forming a mounting for said key cylinder and transmission plate, and bodily mounting said key cylinder and transmission plate in said casing.

4,055,973

EQUIPMENT LOCK

Walter E. Best, c/o Best Lock Corporation, P.O. Box 103, Indianapolis, Ind. 46206

Filed Mar. 11, 1976, Ser. No. 666,048
Int. Cl.² E05B *73/00*
U.S. Cl. 70—58 **17 Claims**



1. An equipment lock, comprising

a plurality of cables adapted to be secured respectively against separation from a plurality of items of equipment and each having a cable end member shaped for engagement in a locking device,

a lock body having a plurality of spaced receptacles for said cable end members, and having a mounting chamber within the body for the reception of keeper means,

and keeper means having a keeping position mounted in said chamber in which it interengages the cable end members received in said receptacles to secure the same against removal from the lock body, said keeper means being movable from said keeping position to release the cable end members for such removal,

and key-operated locking means which in the keeping position of the keeper means is contained within the body and locks said keeper means in said keeping position and which is operable to release the keeper means for movement to release the cable end members.

4,055,974

DISINTEGRATABLE FERTILIZER TABLET

Laban P. Jackson, Jr., Lexington, Ky., assignor to International Spike, Inc., Lexington, Ky.

Filed Mar. 5, 1976, Ser. No. 664,284
Int. Cl.² C05F *11/00*; C05C *9/02*
U.S. Cl. 71—11 **17 Claims**

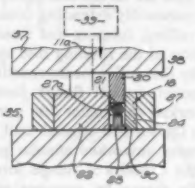
1. A hygroscopic plant fertilizer tablet comprising particles of plant fertilizer source materials said source materials comprising nitrogen, phosphorus or potassium or mixtures thereof mixed with particles of a water swellable, water insoluble hydrophilic polymeric gel compressed into a hard, dense tablet.

4,055,975

PRECISION FORGING OF TITANIUM

Tibor Serfozo, Monterey Park, and Rod F. Simenz, Studio City, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Apr. 1, 1977, Ser. No. 783,607
Int. Cl.² B21J *3/00*
U.S. Cl. 72—42 **18 Claims**



1. The titanium forging process that comprises:

preparing a quantity of titanium or titanium alloy stock shaped to fit within a cavity in a segmented zero draft die and having a volume approximately equal to that of a forged part to be manufactured in the die;

applying a protective coating to said stock;

heating said coated stock and said segmented zero draft die while separted to approximately a predetermined optimum forging temperature for said stock at least as high as about 1200° F;

coating all segments of said die with a lubricant before positioning the stock therein;

positioning the heated stock in the heated die;

heating the die and contained stock further after assembly together and as necessary to give the combination said forging temperature;

applying forging force to said heated segmented die to deform the heated stock partially, but not completely, toward the shape of said cavity;

separating the sections of said segmented die and removing the partially forged stock therefrom;

applying a protective coating again to said partially forged stock;

reheating said partially forged stock and said segmented die while separated to said forging temperature;

coating said die segments again with a lubricant before placing the stock therein for a second time;

repositioning said heated partially forged stock in the segmented die;

reheating the die and stock together;

applying forging force again to the heated die to further deform the heated partially forged stock toward the shape of said cavity; and

separating the die sections and removing the forged stock therefrom.

4,055,976

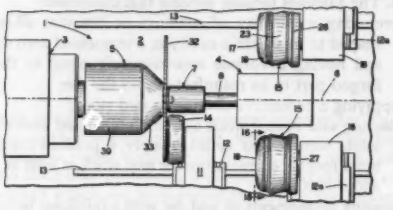
METHOD OF ROLLER SPINNING CUP-SHAPED METAL BLANKS AND ROLLER CONSTRUCTION THEREFOR

Derald H. Kraft, Canton, Ohio, assignor to Aspro, Inc., Canton, Ohio

Filed Mar. 29, 1976, Ser. No. 671,132
Int. Cl.² B21D *22/14*
U.S. Cl. 72—83 **5 Claims**

1. In a method of making a cup-shaped sheet metal blank of the type having a circular bottom hub flange wall and an outwardly extending conical wall terminating in an integrally connected outer cylindrical side wall having an open end from a flat sheet metal disc blank with pressure roller forming means for use as a stage blank for forming a V-grooved pulley, including the steps of:

a. providing a flat sheet metal disc blank having a central hole formed therein;
b. clamping a central portion of the disc around the hole between opposed relatively axially movable complementary clamping faces of rotatable first headstock die means wherein the first headstock die means also has conical flange forming means extending outwardly of the clamping face and terminating in cylindrical flange forming means;
c. rotating the first die means and clamped disc;
d. forming the outwardly extending conical stage blank wall by pressure rolling, forming and ironing an intermediate annular portion of the rotating disc surrounding the central portion by first roller means reacting against the headstock die means conical flange forming means, while leaving unworked an annular disc portion extending outwardly from the formed conical wall;
e. laying the outer unworked annular portion of the blank disc along the cylindrical flange forming means of the headstock die means by pressure rolling with second



roller means said outer annular portion against said cylindrical flange forming means to rough form a cylindrical side wall of a cup-shaped blank, while maintaining the annular portion metal thickness as said outer annular portion metal is being laid to re shaped cylindrical form;
f. thinning and elongating the metal of the rough formed cylindrical side wall progressively simultaneously immediately after the rough forming of said side wall by pressure rolling flow forming the metal with said second roller means rearwardly along the cylindrical flange florming means of the headstock die means;
g. permitting the thinned and elongated flow formed metal to expand outwardly an amount less than the amount of thinning immediately after being thinned and elongated; and
h. further thinning and elongating the expanded metal pogressively simultaneously immediately after the expansion of the initial thinning and elongating of the metal by pressure rolling flow forming the metal with said second roller means further along the headstock die means.

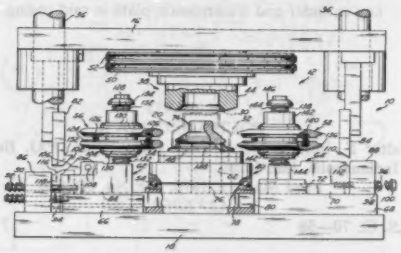
4,055,977

METHOD AND APPARATUS FOR MAKING DOUBLE GROOVE PULLEYS

John W. Haswell, 44429 Harmony Lane, Belleville, Mich. 48111

Filed Feb. 7, 1977, Ser. No. 765,974
Int. Cl.² B21H *1/00*
U.S. Cl. 72—84 **8 Claims**

1. A machine for forming a pulley having a plurality of pulley grooves of given cross section from a pulley blank in the form of a cup, each groove being defined by pulley wall means connected through the root of the groove and each groove being separated from an adjacent groove by a land, comprising axially movable members for engaging said blank adjacent opposed axial ends thereof, means to axially advance at least one of said axially movable members toward the other to a final apposition at which they define a die cavity, first and second rotatably mounted roll die means, said first roll die means including a first forming roll translatable toward the longitudinal axis and the outer sidewall of the cup along a path defined by a first imaginary line connecting a center of rotation of said forming roll and said longitudinal axis and having a periphery adapted to roll form the periphery of the blank to a desired configuration, said second roll die means having a second forming roll positioned between said axially movable members, being translatable away from the longitudinal axis and toward the inner sidewall of the cup along a path defined by a second imaginary line connecting the center of rotation of said second roll die means and said longitudinal axis, and having a periphery adapted to complement the periphery of said first roll die means and to roll form the periphery of the blank to said desired configuration, said first and second imaginary



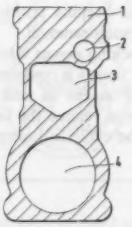
lines being at an angle of greater than 0° with respect to each other, means to establish relative rotation between said pulley blank and said forming rolls, first roll die moving means to advance said first roll die means from a retracted position toward said longitudinal axis to its forming position at which it defines a die cavity corresponding to further portions of a desired configuration, second roll die moving means to advance said second roll die means away from said longitudinal axis toward the inner sidewall of the cup and to said forming position at which it and said first roll die means together define said further portions of said desired configuration.

4,055,978

PROCEDURE FOR MANUFACTURING HYDRAULIC PLUNGER-TYPE PUMP BODIES

Jose Esteban Torralba, Zaragoza, Spain, assignor to Talleres Diesel, S.A., Zaragoza, Spain

Filed Mar. 29, 1976, Ser. No. 671,476
Claims priority, application Spain, Apr. 10, 1975, 436492
Int. Cl.² B21K *1/26*
U.S. Cl. 72—254 **2 Claims**



1. A method of forming a reciprocating pump body having a fuel inlet feed duct, a cavity and a cam shaft housing comprising the steps of:
a. continuously drawing a member having an outside configuration which is the outside configuration of the finished pump body;
b. said member having three longitudinal cavities therein, a first of said cavities being adapted to serve as a fuel inlet feed duct, the second of said cavities being adapted to serve as a cavity, and the third of said cavities being adapted to serve as a cam shaft housing;

c. said first, second and third cavities extending longitudinally completely through said body; and

d. cutting said body to the length required to form a pump body, said cutting being performed normal to the axis of said three longitudinal cavities.

4,055,979

FORMING OF MATERIALS BY EXTRUSION

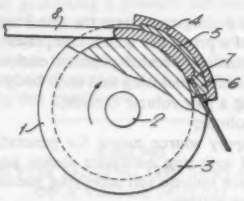
Eric Hunter, Leyland, England, and Derek Green, deceased, late of Langrigg, England (by Muriel Irene Green, executrix), assignors to United Kingdom Atomic Energy Authority, London, England

Filed June 7, 1976, Ser. No. 693,174

Claims priority, application United Kingdom, July 11, 1975, 29316/75

Int. Cl.² B21C *23/08*

U.S. Cl. 72—262 **4 Claims**



1. Apparatus for the forming of materials by extrusion, such apparatus comprising a wheel member with an endless groove in its periphery, a second member fixed relative to said wheel member and cooperating with the wheel member to define an elongate passageway therebetween for receiving at its inlet end material to be extruded at its extrusion end, means for rotating the wheel member in the direction of the passageway from inlet end to extrusion end, an abutment member fixed relative to the wheel member and projecting into the passageway at the extrusion end for blocking it, means defining at least one die orifice in the extrusion end of the passageway and leading therefrom, the material to be extruded being moved towards the die orifice means by frictional engagement with the walls of the endless groove constituting the major part of the passageway, characterised by the provision of means for prestressing the material constituting at least the walls of the endless groove of said wheel member, such means comprising means for preloading the wheel member via cooperating taper surfaces, of which said wheel member includes at least two, for superimposing a circumferential compression in the wheel member.

4,055,980

DIE SET

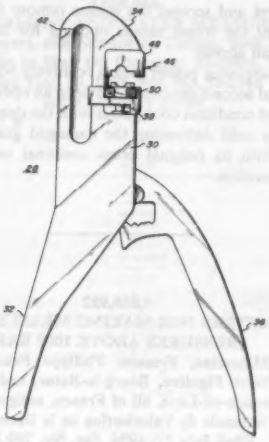
John J. Churla, Belle Mead, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 18, 1976, Ser. No. 733,188

Int. Cl.² B21J *9/08*

U.S. Cl. 72—410 **22 Claims**

1. A die set comprising: a first die member fabricated of a semi-rigid, flexible material and having first and second spaced apart, generally parallel faces; a first recess in said first face to receive a portion of the periphery of a deformable fastener; first and second ridges on said first face, one to either side of said first recess and spaced apart by a first predetermined distance; and a second die member fabricated of a semi-rigid, flexible material and having third and fourth spaced apart, generally parallel faces; a second recess in said third face to receive a portion of the periphery of a deformable fastenera; third and fourth ridges on said third face, one to either side of said second recess and spaced apart by a second predetermined distance less than said first predetermined distance; the engagement of said third and fourth ridges with said first and second ridges when said first and second die members are brought together, align said second recess with said first recess to substantially, completely envelope a deformable fastener



placed in said die set first and second recesses when said first face of said first die member is in contact with said third face of said second die member.

4,055,981

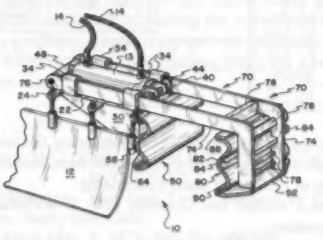
PORTABLE GUARDRAIL STRAIGHTENER FOR FIELD USE

Barry W. Olson, 1361 E. Parkway Ave., Salt Lake City, Utah 84106

Filed Jan. 19, 1977, Ser. No. 760,491

Int. Cl.² B21D *13/02, 37/14*

U.S. Cl. 72—415 **8 Claims**



1. A portable guardrail straightener for field use in highway maintenance comprising:

vehicle means

a pressure-applying mechanism;

means mounting the pressure-applying mechanism to the vehicle means;

the pressure-applying mechanism comprising:

first frame means;

first die means comprising top and bottom edges and opposed ends, the cross sections configuration of the first die means substantially matching the original configuration of a damaged guardrail to be straightened the first die means being mounted adjacent one edge thereof to the first frame means for being positioned adjacent one side of said damaged guardrail in the field;

second frame means;

second die means comprising top and bottom edges and opposed ends, the cross sectional configuration of the second die means substantially matching the configuration of both the damaged guardrail and the first die means, the

second die means being mounted adjacent one edge thereof to the second frame means for being positioned adjacent the other side of damaged guardrail the edges of said first and second die means remote from the edges adjacent the frame means opening for lateral damaged guardrail access;

pressure-applying power means relatively reciprocating the first and second die means between an open condition and a closed condition contiguous with the damaged guardrail thereby cold deforming the damaged guardrail substantially into its original cross sectional and longitudinal configuration.

4,055,982

CALORIMETERS FOR MAKING MEASUREMENTS AT PRESSURES ABOVE 1000 BARS

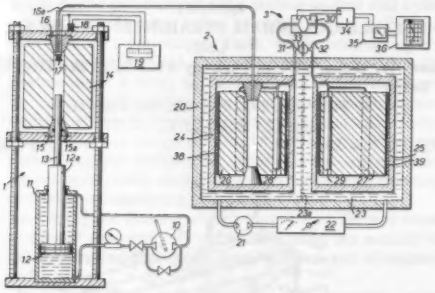
Léon Ter-Minassian, Fresnes; Philippe Pruzan, L'Hay-les-Roses; Pierre Figuiére, Bourg-la-Reine, and Henri Szwarc, Saint-Germain-en-Laye, all of France, assignors to ANVAR-Agence Nationale de Valorisation de la Recherche, France

Filed July 27, 1976, Ser. No. 709,242

Claims priority, application France, July 31, 1975, 75.23884

Int. Cl.[2] G01K *17/00*; G01N *25/20*

U.S. Cl. 73—15 B **10 Claims**



1. A calorimeter suitable for measuring the latent energy of a sample at a pressure of at least 1,000 bars, especially the latent energy of change of state, comprising:

a thick walled test chamber able to withstand very high pressure,

means for changing the state of a sample in said test chamber essentially comprising means for pressurizing said test chamber including pressure measuring means,

a connecting means having a small flow section disposed between said test chamber and said pressurizing means,

a reference body thermally equivalent to said test chamber,

respective thermally insulating jackets surrounding said test chamber and said pressurizing means,

an isothermal enclosure in which said test chamber and said reference body are symetrically arranged,

means for holding said isothermal enclosure at a set temperature,

a differential gas thermometer comprising respective bulbs in thermal contact with said reference body and thick walls of said chamber externally to this latter, and

a two inputs differential pressure measuring unit, each input respectively connected to said thermometer bulbs by capillary connections, where the sensitivity of said differential pressure unit is such that temperature differences lesser than 10^{-5}° C, may be detected within the range — 30° to + 150° C.

4,055,983

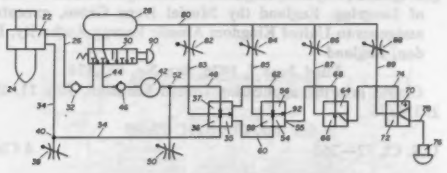
FLUIDIC GAP GAUGE

Michael J. Goes, Dover, and John R. Masly, Landing, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 28, 1976, Ser. No. 754,936

Int. Cl.[2] G01B *13/12*

U.S. Cl. 73—37.5 **4 Claims**



1. A fluidic gap gauging system for checking a shell body-base plate gap of a projectile which comprises:

split-ring hermetically sealed pressure enclosure means for circumferentially enclosing said shell body-base plate gap and creating a gap volume therein;

a reference volume;

pneumatic supply source means for generating a pressure within said split-ring enclosure means gap volume and said reference volume and supplying pneumatic power to said gauging system;

valve means for simultaneously pneumatically pressurizing said split-ring enclosure means gap volume and said reference volume;

fluidic proportional amplifier means for generating a pneumatic output signal in response to a differential pressure input signal;

fluidic Schmitt Trigger means, having a control port pneumatically connected to the output of said fluidic proportional amplifier means switching from an off position to an on position and for generating a pneumatic signal in response to said output signal of said fluidic proportional amplifier means;

a geometrically biased fluidic bi-stable gate having a control input port pneumatically connected to the output of said Schmitt-Trigger, said bi-stable gate being normally biased in a given "off" state;

a pneumatic indicator pneumatically connected to the output of said geometrically biased fluidic bi-stable gate, said indicator giving a visual indication of a "bad" assembly when said split-ring enclosure means gap volume is greater than said reference volume, and giving a visual indication of a "good" assembly when said split-ring enclosure means gap volume is equal to or less than said reference volume; and

fluidic restriction means for adjusting the supply pressure to said gauging system.

4,055,984

DEVICE FOR DETECTING LEAKS IN FLEXIBLE ARTICLES

Joachim Marx, Wesseling, Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany

Filed July 14, 1976, Ser. No. 705,005

Claims priority, application Germany, July 29, 1975, 2533830

Int. Cl.[2] G01M *3/20*

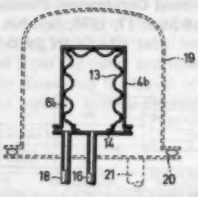
U.S. Cl. 73—40.7 **19 Claims**

1. A device for detecting leaks in an article which includes a readily deformable wall having opposite inner and outer sides; the improvement comprising:

a. a flexible backup wall having opposite inner and outer sides and being arranged for positioning inside an article;

b. closure means secured to said backup wall for defining, together with said outer side of said backup wall and the inner side of an article wall, a coherent space;

c. means for generating a pressure difference between the pressures in said coherent space and at said inner side of said backup wall for causing said backup wall to deform and to engage, with its outer side, the inner side of the article wall for supporting the article wall while maintaining the coherence of said space;



d. means for generating a pressure difference between the pressures in said coherent space and at the outer side of the article wall for causing test gas to penetrate into said coherent space through any leak in the article wall; and
e. detector means communicating with said coherent space for sensing test gas therein.

4,055,985

APPARATUS FOR TESTING THE SURFACE QUALITY OF A VESSEL MOUTH

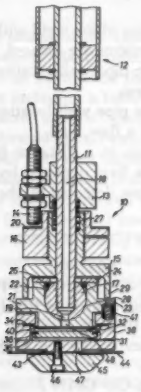
Werner Munz, Obfelden, Switzerland, assignor to Emhart Zurich S. A., Zurich, Switzerland

Filed Dec. 9, 1976, Ser. No. 748,994

Claims priority, application Switzerland, Dec. 24, 1975, 16773/75

Int. Cl.[2] G01M *3/32*

U.S. Cl. 73—49.2 **10 Claims**



1. In an apparatus for testing the surface quality of a vessel mouth, said apparatus including a test head adapted to be placed temporarily over the vessel mouth, means connecting the test head to a source of test gas, passage means through said test head for introducing gas into said vessel, and a pressure measuring instrument connected to said means connecting the test head to a source of test gas, said pressure measuring instrument adapted to generate an electrical signal when a pressure change of a predetermined tolerance value occurs, the improvement comprising:
a. a sealing washer of spring stiffness mounted on said test head and having a first surface for bearing against the vessel mouth, said test head having a bearing surface against which the other surface of said washer bears, and
b. valve means in said test head for opening the passage means when the washer is pressed against a vessel mouth and closing said passage means when the test head is removed from the vessel.

4,055,986

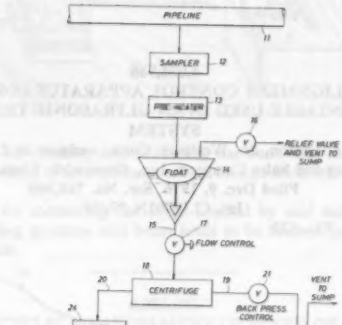
BASIC SEDIMENT AND WATER MEASUREMENT

Thomas L. Stewart, and Edward R. Cadena, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 20, 1976, Ser. No. 752,342

Int. Cl.[2] G01N *15/04*

U.S. Cl. 73—61 R **7 Claims**



1. A process for measuring the water and sediment content of crude oil flowing through a pipeline comprising removing a representative sample of the crude oil from the pipeline, heating the sample, centrifuging the sample to separate the water and sediment from the oil, controlling the vapor pressure in the centrifuge to prevent the escape of any water which has been vaporized by the heating step, passing the water fraction to a condenser to condense whatever water was vaporized during the heating, measuring the water, passing the oil to a tank and measuring the oil.

4,055,987

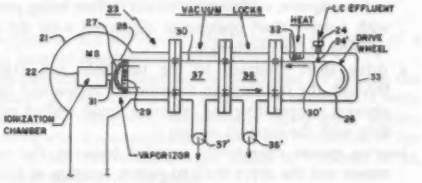
LIQUID CHROMATOGRAPH/MASS SPECTROMETER INTERFACE

William H. McFadden, San Jose, Calif., assignor to Finnigan Corporation, Sunnyvale, Calif.

Filed Mar. 4, 1976, Ser. No. 664,058

Int. Cl.[2] G01N *31/08*

U.S. Cl. 73—61.1 C **6 Claims**



1. An interface for permitting efficient continuous introduction of any dilute solution into the ionization chamber, having an entrance port, of a mass spectrometer comprising: a thin ribbon in the form of a loop; driving means for continuous moving of said ribbon; means for receiving said solution and depositing it on said moving ribbon; a vaporization chamber including a turn-around for said loop in close proximity to said

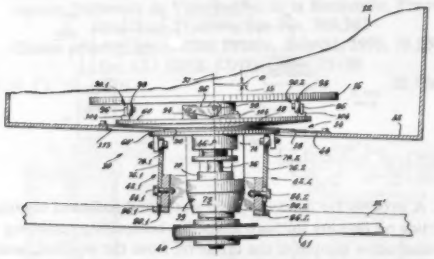
entrance port of said ionization chamber of said mass spectrometer and heating means for vaporizing said deposited solution for introduction into said ionization chamber.

4,055,988

ALIGNMENT CONTROL APPARATUS FOR A TURNTABLE USED IN AN ULTRASONIC TESTING SYSTEM

Arthur L. Dutton, Jr., Westport, Conn., assignor to J. B. Engineering and Sales Company, Inc., Greenwich, Conn.

Filed Dec. 9, 1976, Ser. No. 748,960
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—620 **10 Claims**



1. An apparatus for adjusting the orientation of a rotational turntable relative to a wall of a tank inside of which the turntable is located to support and move a workpiece relative to an ultrasonic testing system movably mounted to the tank for movement in a scanning plane to ultrasonically probe the workpiece when a liquid is in the tank, comprising

a diaphragm mounted in a plane to said tank wall over an adjustment opening thereof, said diaphragm having an access opening and being effectively mounted in liquid sealing relationship with the tank wall, said diaphragm further being formed of a material selected to permit limited flexure of the mounted diaphragm relative to its mounting plane;

support means mounted to the diaphragm to firmly clamp the diaphragm around its access opening, said support means having sufficient rigidity to support the platform and workpiece, said support means further being provided with a drive shaft opening in alignment with the access opening in the diaphragm;

a drive shaft mounted to the turntable and extending through the openings in the support means and the diaphragm in operative and effective liquid sealing relationship with the support means;

bearing means operatively coupled between the support means and the drive shaft to permit rotation of the latter about an axis of rotation while enabling the support means to support the turntable and workpiece; and

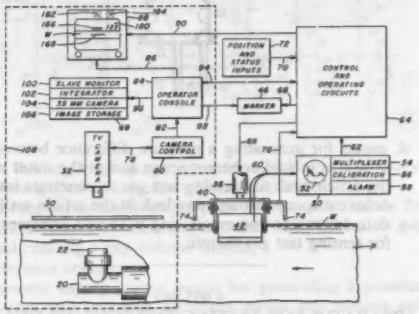
pivot control means operatively connected between the support means and an external segment of said tank to adjust the orientation of the support means whereby said turntable orientation may be adjusted relative to the scanning plane of the ultrasonic testing system from outside of said tank.

4,055,989

WELD INSPECTION SYSTEM WITH DUAL FLAW DETECTION

Edwin Blair Henry, Jr., Mount Lebanon Township, Allegheny County; John A. Patsey, Penn Hills Township, Allegheny County; Ralph G. Rudolph, Edgewood Borough, and Donald G. Schindler, Whitehall Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1976, Ser. No. 667,763
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—588 **10 Claims**



1. A method for inspecting the longitudinal weld in a pipe comprising the steps of

traversing the weld along a path past a pair of adjacent flaw detection systems operating at the same time and located along a path parallel to the longitudinal axis of the pipe, the first system being a fluoroscopic system particularly sensitive to volumetric type flaws and the second system being an ultrasonic system particularly sensitive to planar type flaws,

maintaining the position of the weld with respect to the path along which the systems are located,

placing a mark on the pipe wall location wherever the first system detects a flaw,

placing a mark on the pipe wall location wherever the second system detects a flaw, and

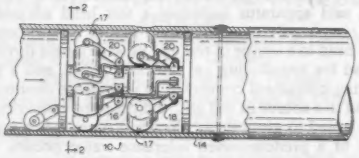
recording the location, as a distance from the end of the length of pipe, of a flaw detected by the first system on one record and a flaw detected by the second system on a second record.

4,055,990

PIPELINE INSPECTION APPARATUS

Frederick Victor Topping, 3 Kirkton Road, Toronto, Canada

Filed July 19, 1976, Ser. No. 706,505
Claims priority, application United Kingdom, July 28, 1975, 31440/75
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—623 **14 Claims**



9. Means for measuring the thickness of walls of a liquid bearing pipeline comprising:

means for supporting, in spaced relation to the inner surface of the wall of a pipeline, a transmitter of and a receiver of ultra-sonic waves,

said supporting means being designed to be moved along said pipeline by the liquid therein,

means, when supersonic radiation is transmitted from said transmitter, for detecting at said receiver, the reception of that reflection, of such radiation reflected at the inner surface of the pipe, and for detecting at said receiver the reception of that reflection of said transmitted radiation, reflected at the outer surface of the pipe,

and means for recording the time interval between reception of the reflections from the outer and inner surfaces,

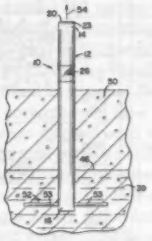
including means for measuring the travel of said supporting means along said pipeline and for correlating said reflection deflections.

4,055,991

LIQUID GAUGE ASSEMBLY

Willie Earl Bridwell, Tampa, Fla., assignor to Kapsura, Inc., Tampa, Fla.

Filed July 12, 1976, Ser. No. 704,487
Int. Cl.² G01F *23/06*
U.S. Cl. 73—73 **7 Claims**



1. A liquid gauge means of the type primarily designed to determine liquid levels in plant containers having liquid and supporting soil material maintained therein, said liquid gauge comprising: a casing including a substantially elongated configuration and a hollow interior, vent means formed in said casing, inlet means formed in said casing in spaced relation to said vent means, both said vent means and said inlet means each comprising at least one aperture disposed in interconnecting relation between the interior and exterior of said casing, whereby air escapes from said vent means as liquid enters said inlet means; indicator means movably mounted on the interior of said casing and comprising a substantially elongated configuration having a longitudinal dimension less than that of said casing, said indicator means structured to be floatable within said casing, whereby the level of liquid within said container is indicated by the relative disposition of said indicator means to predetermined portions of said casing; anchor means connected to said casing and extending outwardly therefrom in substantially transverse relation to the longitudinal axis of said casing and into supported engagement with the supporting soil material, whereby said casing is maintained in substantially upright position due to engagement between the supporting soil material and said anchor means.

4,055,992

BEAM LEAD TESTING APPARATUS

Frank A. Pizzarello, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 16, 1976, Ser. No. 696,676
Int. Cl.² G01N *19/04*
U.S. Cl. 73—88 B **8 Claims**

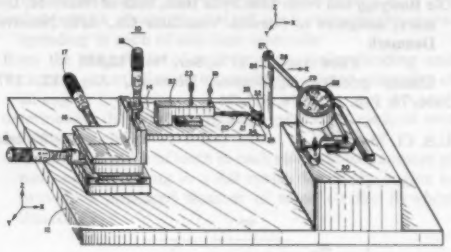
1. An apparatus for testing the strength of beam leads bonded to a device comprising:

table means;

clamp means for holding beam leads to said table means;

a mounting bar adjacent said table means and having means for mounting said device;

said table means and said mounting bar being movable relative to each other;



means for rotating said mounting bar such that the beam leads held to said table means are broken from said device; and

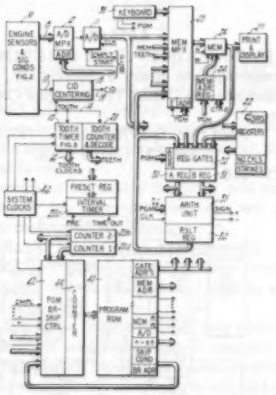
means for measuring the force applied by said means for rotating to cause said beam leads to be broken from said device.

4,055,993

SUB-CYCLIC MEASUREMENT OF SPEED OF AN INTERNAL COMBUSTION ENGINE

Richard J. Rackliffe, Agawam, Mass., and Lee R. Armstrong, Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,220
Int. Cl.² G01P *3/48*; G01M *15/00*
U.S. Cl. 73—116 **5 Claims**



1. Apparatus for sub-cyclic determination of speed of a rotating internal combustion engine, comprising:

means adapted to be disposed on the engine for sensing the passage of teeth on the flywheel of said engine, said teeth delineating successive, substantially equal small angles, each of which is a small fraction of a full revolution of the engine, and providing a sense signal in response to an integral number of the teeth;

timing means responsive to said sensing means for providing a time increment data manifestation of the elapsed time between occurrences of said sense signals from said sensing means;

means presenting a manifestation of the number of teeth on said flywheel; and

processing means reponsive to said angle data manifestation and to said time increment manifestation for generating a manifestation of the speed of the engine.

4,055,994

METHOD AND A DEVICE FOR DETECTING THE STALL CONDITION OF AN AXIAL FLOW FAN OR COMPRESSOR

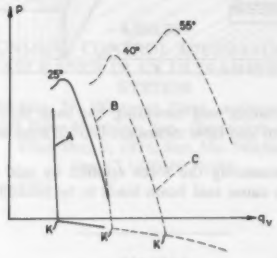
Ole Roslyng, and Niels Erik Friis Dam, both of Naestved, Denmark, assignors to Nordisk Ventilator Co., A/S, Naestved, Denmark

Filed Aug. 12, 1976, Ser. No. 713,958

Claims priority, application Denmark, Aug. 12, 1975, 3656/75; Feb. 10, 1976, 531/76

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—116 10 Claims



1. A method of detecting the stall condition of an axial flow fan or compressor arranged in an air duct, comprising the step of measuring the pressure difference between the total air pressure acting in a direction opposite to the direction of revolution of the fan wheel and a reference pressure corresponding substantially to the static pressure at the wall of the duct in substantially the same radial measuring plane.

4,055,995

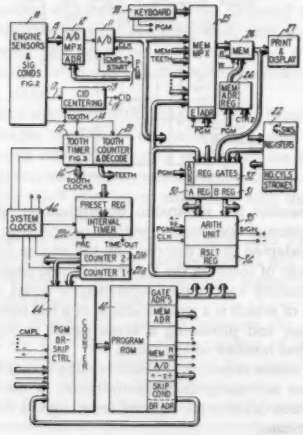
ENGINE AIR-IN-FUEL DIAGNOSTICS

Lee R. Armstrong, and Henry J. Mercik, Jr., both of Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1976, Ser. No. 747,759

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—116 6 Claims



4. In the method of determining the presence of air accumulation in the fuel intake of an internal combustion engine, the steps of:

measuring an indication of horsepower in each of a plurality of successive acceleration bursts from a low engine speed to a high engine speed; and

comparing the measured indication of horsepower for a first one of said acceleration bursts to the indications of horsepower for at least one successive one of said acceleration bursts.

4,055,996

AUTOMOTIVE VEHICLE PERFORMANCE TEST STAND SYSTEM AND PERFORMANCE MEASURING METHOD

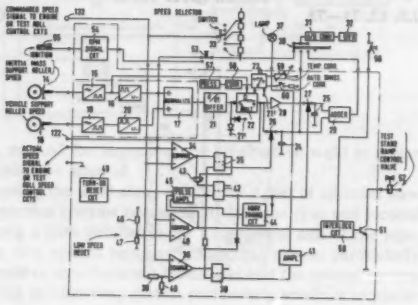
Walter Dinkelacker, Stuttgart; Rudolf Blum, Wendlingen; Klaus Abele, Uhingen; Jurgen Knodler, Remshalden-Grunbach, and Peter Ebinger, Owen (Teck), all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 13, 1976, Ser. No. 722,775

Claims priority, application Germany, Sept. 11, 1975, 2540514; Apr. 8, 1976, 2615193

Int. Cl.[2] G01L *5/13*

U.S. Cl. 73—117 22 Claims



17. Method of dynamically testing the performance of automotive vehicles and of the engines thereof

using a test stand system

having rollers with which the driven wheels of the vehicle are in engagement; inertia flywheel means connected to at least one of the rollers for acceleration by the engine of the vehicle via the wheels of the vehicle through the drive train of the vehicle, and for subsequent deceleration upon interruption of driving connection between the engine and the vehicle wheels;

means (14, 15, 16; 18, 19, 20; 17) sensing an operating parameter related to speed and change thereof and providing a measured speed-related signal;

means (17; 21) sensing traction effort supplied by the wheels upon acceleration, and traction losses upon deceleration and providing a measured torque-related signal;

and combining means responsive to the measured speed-related signal and to the measured torque-related signal and deriving a combined output signal representative of engine performance,

and including the steps of: connecting the drive train of the engine and accelerating the engine while sensing and measuring the speed-related signal and the traction-related signal;

storing a combined first output signal derived during acceleration from said measured signals at a first predetermined engine speed;

then disconnecting the engine to provide for deceleration and driving of the wheels of the vehicle by the inertia flywheel while sensing and measuring the speed-related signal and the torque-related signal;

storing a combined second output signal derived during deceleration from said measured signals at said first predetermined engine speed;

summing the combined first and second output signals to determine performance and power output of the engine by

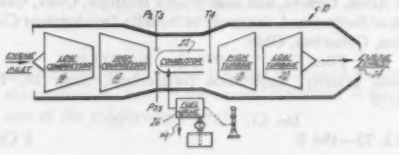
generating a signal representative of losses dependent upon at least one of: traction losses; speed-related losses; constant losses.

4,055,997

MEANS FOR CALCULATING TURBINE INLET TEMPERATURE OF A GAS TURBINE ENGINE

John Kniat, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 15, 1976, Ser. No. 723,364
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—117.3 4 Claims



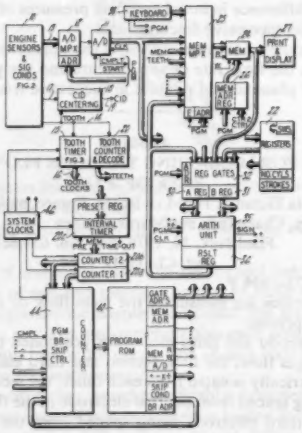
1. Means for ascertaining the turbine inlet temperature of a gas turbine engine including computing means responsive to compressor discharge total and static pressure for producing a first signal indicative of the ratio thereof, function generator means responsive to said first signal for producing a second signal indicative of corrected air flow at the burner of said engine, computer means responsive to said second signal and compressor discharge total pressure and total temperature for producing a third signal indicative of air flow at the burner, means responsive to said third signal and fuel flow to said burner for producing a fourth signal indicative of the fuel-air ratio at the burner and means responsive to said fourth signal and compressor discharge total temperature for producing an output signal indicative of turbine inlet temperature.

4,055,998

WAVEFORM COUNT OF TEETH ON AN INTERNAL COMBUSTION ENGINE FLYWHEEL

James R. Pettingell, Granby, and Lee R. Armstrong, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1976, Ser. No. 747,755
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—119 R 9 Claims



7. In the method of determining the number of teeth on the flywheel of a slowly rotating internal combustion engine, the steps of:

electronically measuring the time intervals between the passage of corresponding successive ones of a large number of teeth of the flywheel past a fixed point;

maintaining a running count of teeth respectively corresponding to each of said time intervals;

from the magnitude of said time intervals, dividing said running count of teeth into cylinder-related subcycles of an engine revolution;

determining the number of teeth related to each of said subcycles; and

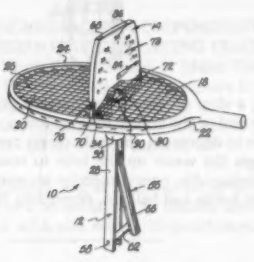
relating the number of teeth in each subcycle to a number of teeth corresponding to a full revolution of the engine to provide a measured number of teeth on the flywheel thereof.

4,055,999

TENSION TESTER FOR TENNIS RACKET STRINGS

James R. Cope, 10500 Cherokee Lane, Leawood, Kans. 66108

Filed Dec. 23, 1976, Ser. No. 753,643
Int. Cl.[2] G01L *5/06*
U.S. Cl. 73—145 10 Claims



1. A device for measuring tension in the strings of the netting in a tennis racket or the like, said netting presenting a pair of opposed faces, said device including:

a base adapted to be positioned against one of said faces;

clamping structure adapted for emplacement against the other of said faces;

securement means for releasably coupling said structure to said base when the structure and base are positioned against their respective said faces;

a plunger shiftably mounted on said base for movement toward and away from a fixed position wherein said plunger projects outwardly from said base in a direction toward said structure;

mechanism on said base for forcibly shifting said plunger to said fixed position when said base is coupled with said structure whereby said plunger is pushed against said one face and said strings are deflected toward said structure;

said plunger including an elastic section adapted to yield proportionately to resistance against movement of the plunger such that said deflection of the strings is inversely related to the tension in said strings; and

a tension gauge on said clamping structure for sensing the deflection of said strings and translating said deflection into a string tension measurement.

4,056,000

ALTITUDE RELEASE MECHANISM

Frank C. Kulhanek, Hinsdale, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 16, 1977, Ser. No. 778,188
Int. Cl.[2] G01W *1/08*
U.S. Cl. 73—170 R 2 Claims

1. An altitude release mechanism for releasing an instrument

from a balloon at a predetermined altitude whereupon the instrument is lowered to the ground by parachute comprising a plastic bottle provided with a cap, said bottle being partially filled with water, a plastic tube sealed in the cap with one end submerged in the water and the other end extending above the top of the cap, said instrument and parachute being connected to the bottle and means for connecting the balloon to the bottle

including a strip of water-disintegrable paper held within the open free end of the plastic tube whereby expanding air in the bottle due to decreased atmospheric air pressure as the balloon rises forces the water up the tube to reach and dissolve the water-disintegrable paper, thereby severing the link between the plastic bottle and balloon, permitting the instrument to fall to earth,

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4,056,001

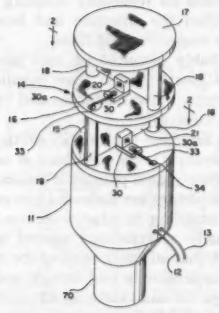
AIR FLOW MEASUREMENT

Jack Arakelian, 2130 MacLarie Lane, Broomall, Pa. 19008

Filed Jan. 10, 1977, Ser. No. 757,893

Int. Cl.[2] G01W *1/02*

U.S. Cl. 73—189 **30 Claims**



1. In a system for detecting and measuring the direction, or velocity, or both of gaseous currents subject to unpredictable variations, comprising:

a sensing head to be subjected to the currents, the sensing head including a pair of substantially planar surfaces positioned at an angle to one another, and adapted to be impinged by the currents,

each surface being of magnetic material, and each surface being subject to transverse displacement in response to impingement by the currents,

a pair of magnetic circuit means respectively in circuit with the different surfaces, each circuit having a reluctance which varies as a function of the transverse displacement of its associated surface,

means for electrically exciting each magnetic circuit means,

means for deriving from each magnetic circuit-means an electric signal corresponding to the excitation as modified by the variations in reluctance, and

means for processing the derived signals to produce an indication of the gaseous currents.

4,056,002

COMPONENT FLOW RATE MEASUREMENT IN TWO-PHASE SYSTEMS

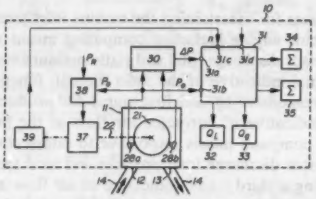
Simon Arieh, Geneva, and Jean-Pierre Budliger, Onex, Geneva, both of Switzerland, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Sept. 15, 1976, Ser. No. 723,494

Claims priority, application Switzerland, Sept. 19, 1975, 12225/75

Int. Cl.[2] G01F *1/06, 5/00*

U.S. Cl. 73—194 R **8 Claims**



1. A method for continuously measuring the rate of flow of each phase of a concentrated gas-liquid mixture in which the phases move at fluctuating flow velocities relative to one another wherein the method comprises,

a. dividing said mixture into fixed, separate, successive fractions of a first predetermined volume,

b. measuring an initial pressure of said mixture in said successive fractions at the first predetermined volume.

c. varying the volume of said mixture in said successive fractions to a second predetermined volume,

d. measuring a final pressure of said mixture in said successive fractions at the second predetermined volume,

e. measuring the flow rate of said mixture,

f. determining the proportion of each phase in said mixture in said successive fractions from a comparison of the difference in the first and second predetermined volumes and the difference in initial and final pressures of said mixture in said successive fractions, and

g. determining the rate of flow of each phase in said mixture from the flow rate of said mixture and the proportion of each phase in said mixture in successive fractions.

4,056,003

DEVICE FOR MEASURING THE MASS FLOW OR FLOW RATE OF A GAS

Jean Louis Zizine, L'Hay-Les-Roses, France, assignor to S.C.I. Le Brin, Champigny sur Marne, France

Filed Nov. 24, 1975, Ser. No. 634,631

Int. Cl.[2] G01F *1/56*

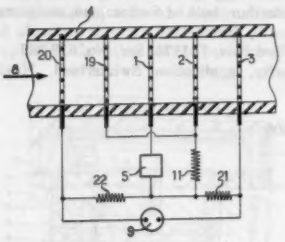
U.S. Cl. 73—194 F **6 Claims**

1. A device for measuring the mass flow or rate flow of a gas, comprising:

first, second and third electrodes positioned in the path of the gas flow, the first, second and third electrodes being electrically isolated from each other, the second electrode being spaced from the first electrode in the flow direction, the third electrode being spaced from the second electrode in the flow direction;

a voltage source coupled between the first electrode and the

second and third electrodes for producing a corona discharge localized about the first electrode and for creating



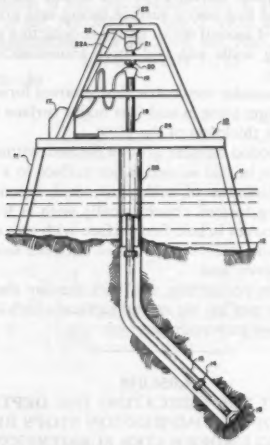
an electric field such that the ions produced by the first electrode move toward the second electrode, in the direction of the gas flow.

4,056,004

MULTIPLE ARM PAD INSTRUMENT FOR LOGGING HIGHLY DEVIATED BOREHOLES

Raymond Earl Roesner, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 2, 1976, Ser. No. 719,759
Int. Cl.[2] E21B *49/00*
U.S. Cl. 73—151 **4 Claims**



1. An apparatus for investigating the formations surrounding an earth borehole, comprising:

an elongated instrument adapted to traverse an earth borehole;

a plurality of arm pad members carried by said instrument, at least one of said pad members having an earth formation investigative device adapted to contact the walls of the borehole, said arm pad members also each comprising: a bow spring having two ends, one of said ends being anchored to said instrument;

a plurality of sliding members slidably mounted on said instrument, each of said bow springs having their second ends connected to different ones of said sliding members; and

means for causing said sliding members to slide in a direction away from the anchored ends of said bow springs, thereby facilitating the movement of said instrument through a borehole.

4,056,005

BLOCKED ISOCYANATE COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Turtle Creek; Joseph F. Meier, Export, and David C. Phillips, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1975, Ser. No. 568,222
Int. Cl.[2] G01K *11/02*; C09K *3/00*
U.S. Cl. 73—339 R **53 Claims**

1. A composition comprising at least one blocked isocyanate solution of a resinous carrier curable and stable at 60°C, and unreactive with said blocked isocyanate.

4,056,006

METAL DITHIOCARBAMATE COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Turtle Creek; Joseph F. Meier, Export, and David C. Phillips, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 21, 1975, Ser. No. 634,217
Int. Cl.[2] G01K *11/02*; C09K *3/00*
U.S. Cl. 73—339 R **20 Claims**

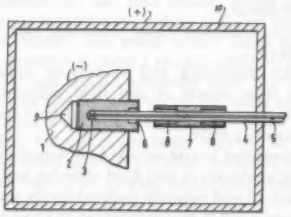
7. A composition comprising at least one metal dithiocarbamate and a solution of a resinous carrier curable and stable at 60°C, and unreactive with said metal dithiocarbamate.

4,056,007

ARRANGEMENT FOR TREATING WORKPIECES BY CORONA DISCHARGE WITH SHORT-CIRCUIT PREVENTION FEATURE

Johannes Luckan, Cologne, Germany, assignor to Ionit Anstalt Bernhard Berghaus, Vaduz, Liechtenstein

Filed Feb. 14, 1977, Ser. No. 768,354
Claims priority, application Germany, Feb. 18, 1976, 2606454
Int. Cl.[2] G01K *1/08*; B01K *1/00*
U.S. Cl. 73—343 R **9 Claims**



1. In an arrangement for measuring the temperatures of workpieces to be treated in a corona discharge field, particularly of workpieces to be nitrided in the presence of a nitrogeneous medium, a combination comprising a container for receiving a workpiece to be treated; means for establishing an electrical potential gradient between said container and the workpiece to thereby produce between the container and the

workpiece a corona discharge field of ionized particles and concomitantly heat the latter; means for measuring the temperature of the workpiece, including heat sensing means mounted in the workpiece and extending along a path from the workpiece through said field of particles in said circumambient region and thereupon to the exterior of said container, said heat sensing means tending to be covered by metal particles along said path; and means for preventing deposition of said particles at selected portions of said path so that formation of a continuous electrically-conductive path comprised of particles deposited on said heat sensing means is avoided, whereby discontinuance of the electrical potential gradient due to short-circuiting between said container and the workpiece is prevented.

4,056,008

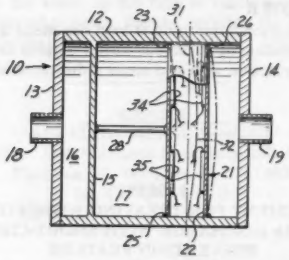
TRANSDUCING METHODS AND TRANSDUCERS

Winfield Sample, Sierra Madre, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 593,395, July 7, 1975, Pat. No. 3,981,198. This application June 28, 1976, Ser. No. 700,671

Int. Cl.[2] G01L *9/02, 7/08*

U.S. Cl. 73—398 AR **4 Claims**



1. A fluid pressure transducer, comprising in combination:
a housing;
means including a diaphragm for defining a fluid chamber in said housing;
means connected to said housing for admitting a fluid to said fluid chamber;
strain gage transducer signal generating means in said fluid chamber;
means for protecting said transducer signal generating means from effects of said fluid, including a laterally flexible tubular enclosure having an inner wall surface and two opposite ends;
means connected to said tubular enclosure for mounting said tubular enclosure in said fluid chamber and for maintaining both of said opposite ends relatively stationary;
means connected to said diaphragm and to a portion of said tubular enclosure between said opposite ends for laterally flexing said tubular enclosure with a fluid pressure force picked up by said diaphragm; and
means for bonding said strain gage transducer signal generating means to said inner wall surface of the tubular enclosure for measurement of the strain of a wall portion of said tubular enclosure at said wall surface during said flexing of the tubular enclosure.

4,056,009

DIAPHRAGM ARRANGEMENT FOR PRESSURE TRANSDUCERS

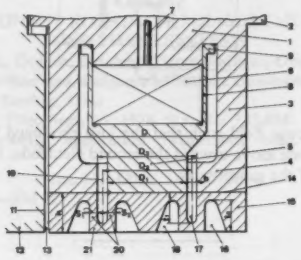
Hans Conrad Sonderegger, Neftenbach, and Hans Ulrich Baumgartner, Winterthur, both of Switzerland, assignors to Kistler Instrumente AG, Switzerland

Filed Nov. 7, 1975, Ser. No. 629,987

Claims priority, application Switzerland, Nov. 8, 1974, 014968/74

Int. Cl.[2] G01L *7/08, 9/04*

U.S. Cl. 73—406 **28 Claims**



8. In a pressure transducer system comprising a housing having walls, a transducing element mounted within said housing, a force transmission member mounted within said housing at an annular separation from said walls for transmitting forces to said transducing element, and a diaphragm mounted on an end of said housing in contact with said force transmission member for imparting pressure values of a pressure medium to said force transmission member, the improvement comprising said diaphragm including
a diaphragm plate having first and second parallel major surfaces, said first major surface facing said pressure medium and said second major surface contacting surfaces of said housing walls and said force transmission member respectively,
a plurality of annular concentric first grooves formed within said diaphragm plate in said first major surface to a depth less than the thickness of the plate,
at least one second annular groove formed within said diaphragm plate in said second major surface to a depth less than the thickness of said plate, said second annular groove being formed concentrically with at least two of said first grooves in said first surface with two concentric annular elastic walls being formed between said first and second grooves, and
an annular rim connecting said two annular elastic walls, said annular rim having an end surface which is coplanar with said first major surface.

4,056,010

INSTRUMENT FOR INDICATING THE DEPTHS AND DURATIONS OF DECOMPRESSION STOPS REQUIRED DURING UNDERWATER SUBMERSIONS

Carlo Alinari, Corso Vittorio Emanuele, 200 - Turin, Italy

Filed Jan. 2, 1976, Ser. No. 646,105

Claims priority, application Italy, Jan. 17, 1975, 67101/75

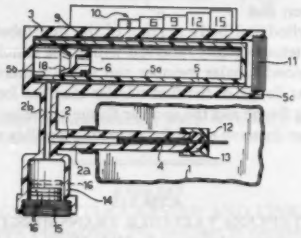
Int. Cl.[2] G06G *5/00;* **G01F** *23/14*

U.S. Cl. 73—432 R **5 Claims**

1. In an instrument for determining the depths and durations of decompression stops required to be made by a diver when ascending after a submarine dive, of the type including:
a first chamber having a resilient wall,
a second chamber having rigid walls,
means interconnecting said first and second chambers, said interconnecting means including a restrictor throttle for delaying the transfer of gas from one chamber to the other upon the occurrence of changes in the pressure to which they are both subject;

the improvement wherein said second chamber is formed as a cylindrical chamber of a transparent material,

an inner cylinder is housed coaxially within the cylinder comprising said second chamber, said inner cylinder being at least semi-transparent and communicating with said second chamber through an opening at one end of said inner cylinder, the other end of said inner cylinder being closed,



a piston slidingly and sealingly housed in said inner cylinder, the position of said piston being observable from outside said second chamber and representing the pressure obtaining at any time within said second chamber, and

a fixed scale on said rigid chamber against which the position of said piston can be compared to determine the depth and duration of decompression stops required.

4,056,011

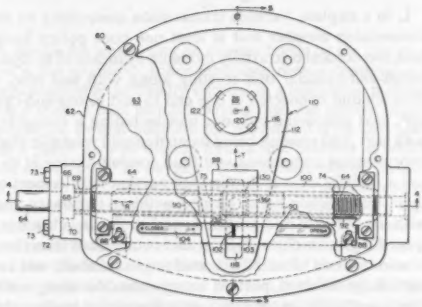
SCOTCH YOKE

William L. Carlson, Jr., St. Cloud, Minn., assignor to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 530,639, Dec. 9, 1974, which is a division of Ser. No. 385,379, Aug. 3, 1973, abandoned. This application June 14, 1976, Ser. No. 695,891

Int. Cl.[2] F16H *21/15*

U.S. Cl. 74—50 **5 Claims**



1. In a scotch yoke comprising a housing with a hole therethrough, a threaded rod extending along an axis through said hole in a first direction, means for preventing said rod from moving in said first direction, a yoke arm in said housing pivotable about an axis and extending in a second direction that intersects said first direction, slot means in said yoke arm, the improvement comprising:

a member on said rod and threadingly engaged therewith, said member having projection means extending through said slot means, and a means cooperating with said projection means for absorbing thrust in a sideward direction on said yoke arm and in a sideward direction on said rod, said means for absorbing thrust being positioned in a plane which includes said axis of said rod and is perpendicular to said sideward direction of said rod to thereby minimize bowing and twisting in said yoke arm and said rod, said means for absorbing sideward thrust to minimize bowing and twisting comprises a guide strap fixed to said housing and a saddle slidably mounted on said guide strap, said guide strap extending in said first direction, said projection means fitting into a hole in said saddle to link said saddle member to said yoke arm, whereby rotation of said rod slides said member in said first direction and pivots said yoke arm about said axis.

4,056,012

LINKAGE SYSTEM FOR WARP KNITTING MACHINE

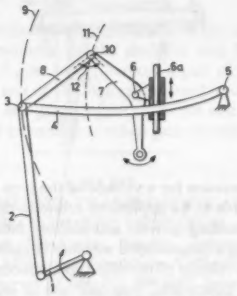
Karl Kohl, 10 Chlorodont Strasse, Obertshausen, Germany (6053)

Filed Nov. 1, 1974, Ser. No. 520,174

Claims priority, application Germany, Nov. 2, 1973, 2354824; Nov. 5, 1973, 2355235

Int. Cl.[2] F16H *21/40*

U.S. Cl. 74—81 **2 Claims**



1. A motion transmitting linkage system including a plurality of linkage means, each having at least a first and a second end, said system comprising:

a first linkage means for driving said system, said first linkage means being adapted to rotate about the first end thereof;

a second linkage means having the first end thereof rotatably connected to the second end of said first linkage means;

a third linkage means having the first end thereof rotatably connected to the second end of said second linkage means and having the second end thereof rotatably attached to a first relatively fixed reference point, said first end of said third linkage means being adapted to describe a first arc about said first relatively fixed reference point;

a fourth linkage means having a first end thereof rotatably connected to the second end of said second linkage means;

a fifth linkage means having the first end thereof rotatably attached to the second end of said fourth linkage means and the second end thereof adapted for connection to an output mechanism, said fifth linkage means including a pivot section located intermediate said first and said second ends thereof, said pivot section being adapted for rotatable attachment about a second relatively fixed reference point, said second relatively fixed reference point being located substantially within the ambit of said third linkage means when it describes said first arc, said first end of said fifth linkage means being adapted to describe a second arc about said second fixed reference point; and,

an adjustment means for moving said second relatively fixed reference point in a direction approximately perpendicular to the effective length of the third linkage means when the angle between said fourth and fifth linkage means is approximately 90° with respect to one another at the common point thereof,

wherein the effective length of the third linkage means measured from its first end to its second end is greater than the distance between said first relatively fixed reference point and said second relatively fixed reference point and further, wherein said effective length of said third linkage

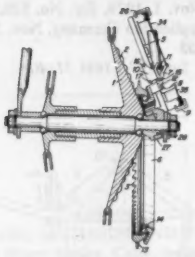
means is greater than the distance from the first end of said fifth linkage means to the pivot section of said fifth linkage means so that the radius of curvature of said first arc is greater than the radius of curvature of said second arc.

4,056,013

BICYCLE TRANSMISSIONS

W. Henry Snyder, 4272 McKay St., Salt Lake City, Utah 84107, assignor to W. Henry Snyder, Salt Lake City, Utah

Filed Feb. 11, 1976, Ser. No. 657,158
Int. Cl.[2] F16H *7/22, 9/08, 9/24*
U.S. Cl. 74—217 B **3 Claims**



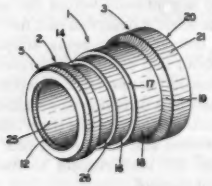
1. A transmission for a vehicle of the type having a wheel to which power is to be applied to rotate it, drive means to provide wheel-turning power, and shifting means, said transmission including a cone-shaped member adapted for mounting on a wheel of a vehicle of the said type, concentrically about the axis thereof; concentric, ring-like sets of teeth formed on the cone-shaped member's tapered surface; a sprocket ring encircling the axis of said cone-shaped member and adapted to be rotatably mounted on the shifting means of the vehicle; the sprocket ring being adapted to be driven by the drive means of the vehicle and always lying and being shifted in a plane perpendicular to the axis of said wheel of the vehicle; engagement means on one side of said sprocket ring and adapted to cooperate with the ring-like sets of teeth on said cone-shaped member, said sprocket ring being shiftable both toward the cone-shaped member and radially toward or away from the axis of said cone-shaped member, so as to permit the engagement means to cooperate with a different set of ring teeth for purposes of ratio change.

4,056,014

SINTERED PULLEY HUB CONSTRUCTION AND METHOD OF MAKING SAME

Derald H. Kraft, Canton, Ohio, assignor to Aspro, Inc., Canton, Ohio

Filed Apr. 26, 1976, Ser. No. 680,427
Int. Cl.[2] F16H *55/36, 55/44*
U.S. Cl. 74—230.4 **13 Claims**



1. A pulley hub construction including:

a. first and second tubular members;

b. the first tubular member having a main cylindrical body terminating at one end in a radially outwardly extending annular flange;

c. the second tubular member having an interior annular cavity formed in one end thereof and a radially outwardly extending annular flange formed on the other end thereof;

d. the outer surface of the cylindrical body of the first tubular member having a diameter generally equal to the diameter of the interior annular cavity of the second tubular member; and

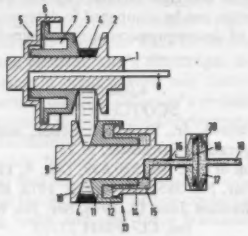
e. the cylindrical body portion of the first tubular member being telescopically received within the annular cavity of the second tubular member and secured therein with the annular flange of the first tubular member forming a hub pulling flange and the annular flange of the second tubular member forming a seat for mounting a pulley cup thereon.

4,056,015

STEPLESS VARIABLE TRANSMISSION

Hemmo Hermannes Johannes Ludoph, Heeze, and Petrus Henricus van Deursen, Deurne, both of Netherlands, assignors to van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed May 11, 1976, Ser. No. 685,419
Int. Cl.[2] F16H *55/52*
U.S. Cl. 74—230.17 F **3 Claims**



1. In a stepless, variable transmission comprising an endless transmission member and at least one cone pulley having at least one conical disc axially movable by means of an hydraulic piston-and-cylinder unit rotating along with said disc, and a fluid conduit connected at one end to said piston-and-cylinder unit, said piston-and-cylinder unit including a rotatable shaft with said fluid conduit being located in said rotatable shaft, the improvement comprising said fluid conduit having at its other end a radially outwardly directed portion with respect to said shaft, said portion being located within a stationary chamber with the outlet of said portion in said stationary chamber being spaced a greater distance from said rotary shaft than the outlet of said one end of said fluid conduit in said shaft, said radially outwardly directed portion being rotatable along with said piston-and-cylinder unit in said stationary chamber through which chamber fluid is supplied to, and discharged from, said piston-and-cylinder unit.

4,056,016

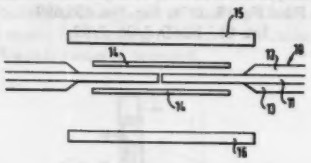
BELTING

Peter Lothar Ernst Möring, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Sept. 27, 1976, Ser. No. 726,781
Claims priority, application United Kingdom, Oct. 3, 1975, 40499/75
Int. Cl.[2] F16G *1/00*
U.S. Cl. 74—231 J **19 Claims**

9. Belting having a layer of cover material and an embedded longitudinal reinforcement structure which is longitudinally compressible, and a joint region in which ends of the embed-

ded reinforcement structure are in end-to-end relationship and covered by an overlying layer of substantially weftless fabric



having a compression absorbing warp with warp members of the fabric positioned parallel to the length of the belting.

4,056,017

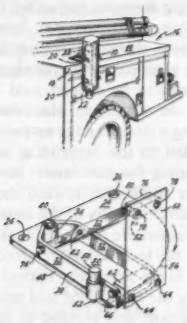
OXYGEN BOTTLE CARRIER AND LINKAGE

Clyde A. Cobb, Feasterville, Pa., assignor to Ziamatic Corporation, Yardley, Pa.

Filed Mar. 22, 1976, Ser. No. 668,934

Int. Cl.[2] A62C *27/00;* **A47G** *29/00;* **B66C** *23/00;* **F16M** *11/12*

U.S. Cl. 74—522 **5 Claims**



4. A device for supporting an oxygen bottle or the like on a shelf of a fire engine or other mounting means comprising a platform adapted to be fixedly secured in a horizontal position on such a shelf, a base member having one end thereof pivotally connected to said platform for movement over said platform in a plane parallel thereto from a first position in which the base member and an oxygen bottle thereon extend parallel to said shelf to a second position in which the opposite end of the base member projects beyond an edge of said shelf, a support member pivotally mounted adjacent said opposite end of said base member for movement at right angles to said platform into and out of a vertical position adjacent said shelf when said platform is moved to said second position, and folding linkage members connected to said base member and support member for holding said support member and an oxygen bottle secured thereto in said vertical position.

4,056,018

MULTIPLE POWER PATH CONCENTRIC SPEED REDUCER

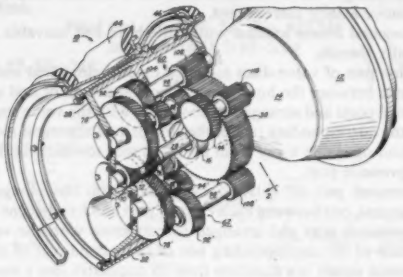
Jackson Chung, Mishawaka, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Sept. 10, 1976, Ser. No. 722,026

Int. Cl.[2] F16H *37/06, 35/00, 57/00*

U.S. Cl. 74—665 P **29 Claims**

1. A multiple power path, concentric speed reducer comprising center shaft means, axle means disposed coaxially around said shaft means, a first pinion having two sets of gear teeth thereon mounted on said shaft means for rotation therewith, an externally toothed gear mounted on said axle means, and two gear trains operatively interconnecting said pinion with said gear mounted on said axle means for distributing the load transmitted between said shaft means and said axle means and producing relative rotation between said shaft means and axle means, each gear train having a first gear engaging one of



the sets of gear teeth on said pinion, a shaft for said first gear, a second pinion mounted on the shaft for said first gear and having two sets of gear teeth thereon, a pair of second gears engaging the two sets of teeth on said second pinion, shafts for said pair of gears, and gears on the shafts for said pair of gears meshing with said externally toothed gear on said axle means.

4,056,019

TORQUE CONVERTER TRANSMISSION AND VALVE ARRANGEMENT THEREFOR

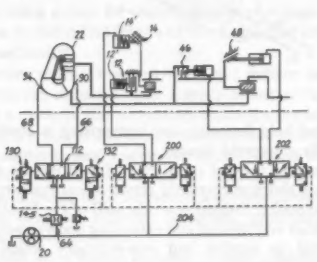
Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm-Vallingby, Sweden

Continuation-in-part of Ser. No. 695,043, June 11, 1976, abandoned, which is a continuation of Ser. No. 549,448, Feb. 12, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,421

Claims priority, application United Kingdom, Feb. 14, 1974, 6856/74; Dec. 18, 1974, 54770/74

Int. Cl.[2] F16H *47/04*

U.S. Cl. 74—677 **46 Claims**



1. A torque converter having a working chamber with at least a pump part and a turbine part, said pump part having at least one ring of pump blades and said turbine part having at least one ring of turbine blades,

a fluid communication system within the torque converter for controlling its mode of operation,

a valve device for controlling the flow of fluid in said fluid communication system,

said valve device comprising,

an elongated bore,

at least five ports opening into said bore including a high pressure port, a pair of control ports in communication with the fluid communication system of the torque converter and located, longitudinally, one on each side of said high pressure port, and a pair of low pressure ports located, longitudinally, one beyond each control port on the side thereof opposite from said high pressure port,

a first pair of abutment means located, longitudinally, one

between the high pressure port and each of the control ports, and a second pair of abutment means located, longitudinally, one between each control port and its adjacent low pressure port, each of the abutment means including surfaces located in a radial plane constituting means for defining a valve seat for a disc valve element adapted to move axially thereagainst,

elongated means located within the bore and movable axially therein,

a first pair of valve discs mounted on said elongated means, one between the high pressure port and each of said control ports and arranged to cooperate with the valve seat of the corresponding one of the first pair of abutment means and openable away from its valve seat towards the high pressure port,

a second pair of valve discs mounted on the elongated means, one between each control port and its adjacent low pressure port and arranged to cooperate with the valve seat of the corresponding one of the second pair of abutment means in a direction from its respective low pressure port towards its respective control port such that it is openable towards its respective low pressure port,

and means operatively associated with the elongated means for selectively opening said valve discs upon axial movement of the elongated means.

4,056,020

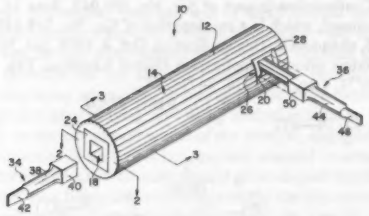
HAND-GRIPPABLE DRIVER-FASTENER TOOL

Joseph Coviello, 163-09 99th St., Howard Beach, N.Y. 11414

Filed Aug. 24, 1976, Ser. No. 716,995

Int. Cl.[2] B25B *15/00*

U.S. Cl. 81—177 A **6 Claims**



1. A hand-held fastening tool comprising in combination:

an axially elongated handle;

a first socket formed in an end of said handle adapted to receive and non-rotatably retain a first fastener therein;

a second socket formed in a side wall of the handle adjacent the other end thereof and extending transversely thereinto adapted to receive and non-rotatably retain a second fastener therein;

an aperture of lesser lateral dimension than said second socket formed in said handle adjacent said other end extending transversely thereinto and openly communicating with said second socket;

a first driver-fastener comprising an axially extending shank having a tang at one end thereof dimensioned to fit non-rotatably and be releasably retained within said first socket and a fastening element at the other end thereof;

and a second driver-fastener comprising an axially extending shank having first and second blade-type fastening elements at the opposed ends thereof and a tang formed at an intermediate location, said tang being dimensioned to fit non-rotatably and be releasably retained within said second socket, the portion of said shank extending from said tang to one of said first and second fastening elements being dimensioned in length and in width to extend through said transverse aperture in said handle such that said one fastening element projects outwardly of said aperture for operative use.

4,056,021

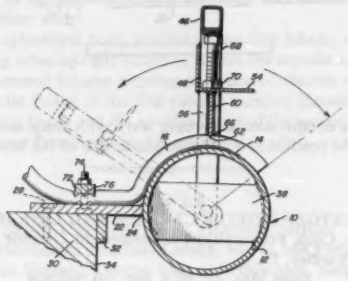
IRRIGATION HOSE AND BELT SPLICE PREPARING TOOL

Edward H. Lacey, P.O. Box 796, Trent, S. Dak. 57065

Filed Feb. 9, 1976, Ser. No. 656,699

Int. Cl.[2] B26D *3/06, 7/02*

U.S. Cl. 83—4 **10 Claims**



1. A tool for preparing an elastomeric item having longitudinal, flexible reinforcing elements embedded therein for splicing by stripping the elastomeric material from the reinforcing elements and exposing them for connection with identical exposed reinforcing elements when forming a splice between adjacent ends of items to be spliced, said tool comprising a supporting surface on which an elastomeric item may be placed, a knife having a straight edge extending transversely of and generally parallel to the supporting surface and elastomeric item for engaging the elastomeric item, and means supporting the knife for adjustment toward the elastomeric item and for movement longitudinally of the elastomeric item while engaged with the elastomeric material for stripping the elastomeric material from the longitudinal reinforcing elements, said supporting surface being arcuately curved with the axis of curvature paralleling the knife edge, said means supporting the knife including a support arm pivoted to move about an axis coincident with the center of curvature of the arcuate supporting surface whereby the knife moves in an arcuate path concentric with the arcuate supporting surface.

4,056,022

KNIFE GROWTH DETECTOR

Eric Thomas Ray, Andover, England, assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 13, 1977, Ser. No. 759,316

Claims priority, application United Kingdom, Feb. 19, 1976, 6589/76

Int. Cl.[2] A24C *5/28;* **B26D** *7/24, 7/12*

U.S. Cl. 83—62 **8 Claims**

1. In a cutting machine having a housing, a cutter drum mounted in the housing, a plurality of knives carried on said drum, means for rotating the cutter drum about its axis, means for feeding material to be cut to the cutter drum, means for grinding the knives to maintain a sharp knife edge, means for advancing the knives as they are worn away by the grinding means, a drum diameter being defined by the path of the knife edges as the cutter drum rotates, the provision of a detecting device to detect when a knife has been advanced beyond the cutter drum diameter, said device comprising:

a movable support carried on said housing and movable into and out of a working position;

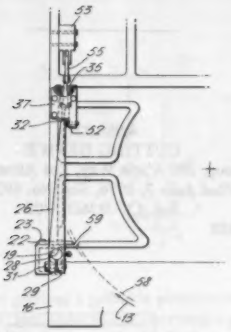
a detector blade mounted on the movable support and having an edge positioned in proximity to the cutter drum diameter when the movable support is in its working position;

a trip lever connected to the movable support;

a latch mechanism mounted on the housing to retain the trip lever when the movable support is in its working position;

a switch operated by the latch mechanism when the latch mechanism is disengaged by said trip lever; and

circuit means for stopping rotation of the cutter drum when said switch means is operated,



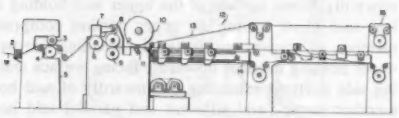
the arrangement being such that, in use, a knife which has been advanced beyond the cutter drum diameter strikes th detector blade thereby causing the movable support to move out of the working position and the latch mechanism to be disengaged by said trip lever.

4,056,6..

SINGLE WEB SHEET CUTT.R AND STACKER

Robert O. Wilt, Cumberland, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,971
Int. Cl.[2] B26H *29/12*
U.S. Cl. 83—155 **11 Claims**



1. A sheet cutting, conveying and stacking machine comprising in combination, means for advancing a web of material to a sheet cutting device where the web is cut into sheets, a sheet receiving and conveying means for conveying the cut sheets from the cutting device to a sheet collecting station and a sheet slow down means for delivering the cut sheets to a stacking station, the improvement comprising means associated with the sheet receiving and conveying means for receiving and conveying cut sheets of different lengths said means comprising:

a. a roller assembly comprising at least one pair of nip rolls mounted on the machine for fore and aft movement in the direction of web travel;

b. means for selectively opening and closing the nip between said nip rolls; and,

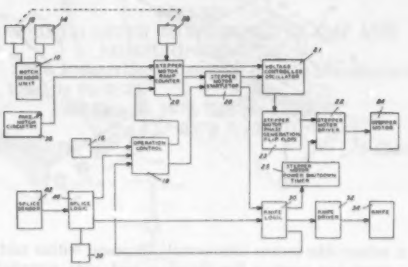
c. means for moving the nip rolls linearly toward and away from said cutting device in response to the sheet length cut.

4,056,024

WEB ADVANCEMENT AND CUTTING MECHANISM AND METHOD

Victor R. Baert, Anoka, and Ronald B. Harvey, Minneapolis, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Oct. 31, 1975, Ser. No. 627,526
Int. Cl.[2] B26D *5/32, 5/34*
U.S. Cl. 83—210 **12 Claims**



1. A film advancement mechanism for film in a film processor comprising:

initiate means connected to the film processor for initiating a cycle of film advancement by the mechanism,

digital stepper motor means for advancing film in the processor,

drive means for said stepper motor, responsive to said initiate means, for gradually increasing the drive frequency of said stepper motor at the beginning of a cycle of film advancement, driving said stepper motor through a cycle of film advancement and then gradually slowing the drive frequency of said stepper motor at the end of a cycle of film advancement,

indicia sensing means for sensing indicia positioned in fixed relation to individual frames of film as the film advances in said mechanism,

first counter means, responsive to said initiate means, for counting the steps that said stepper motor advances said film in a cycle of film advancement until a predetermined number is reached and then activating said indicia sensor,

second counter means, responsive to said indicia sensor, for controlling said drive means for said stepper motor to cause said motor to be advanced a predetermined number of steps after an indicium is sensed, gradually slowed down and then stopped,

wherein said drive means includes voltage controlled oscillator means for producing a variable frequency signal in response to signals from said first and second counter means and said initiate means, and stepper motor drive means for controlling said digital stepper motor means in response to the variable frequency signal, and

fake indicia counter means to count steps of said stepper motor after said indicia sensor has been activated for causing said stepper motor to be stopped if an indicium has not been sensed after a predetermined number of advancement steps have occurred.

4,056,025

STRIP CUTTING APPARATUS

Laurence P. Rubel, 34 Clark Drive, Howell, N.J. 07731

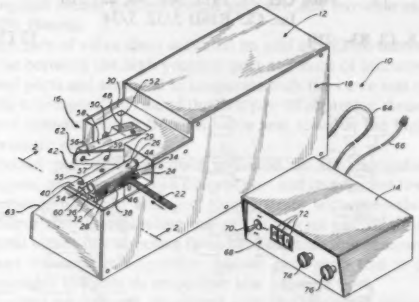
Filed Apr. 2, 1976, Ser. No. 673,101
Int. Cl.[2] B26D *5/20*
U.S. Cl. 83—261 **17 Claims**

1. A strip cutting apparatus comprising:

a. housing having a longitudinal and transverse axis and

including an enclosed portion and an open work receiving portion;

b. means for feeding strip material along the transverse axis of said open portion, the driven portion of said feeding means engaging the upper surface of said strip material; and



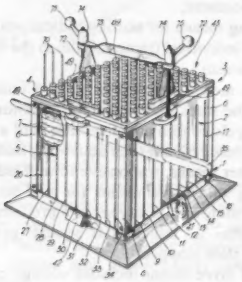
c. scissor-like means transversely disposed within said work receiving portion for shearing said strip material, said scissor-like means being activated simultaneously with the inactivation of said feeding means.

4,056,026

APPARATUS FOR CUTTING MEAT

Dimitrios P. Panaritis, and Spyros A. Iacovidis, both of Thessaloniki, Greece, assignors to Georges P. Panaritis and Panayotis P. Panaritis, both of North Bay, Canada

Filed Sept. 28, 1976, Ser. No. 727,537
Claims priority, application Greece, Oct. 1, 1975, 53287
Int. Cl.[2] B26D *3/24*
U.S. Cl. 83—454 **7 Claims**



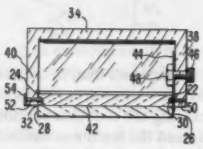
1. In a device for guiding a knife to facilitate uniform cutting of a stack including meat slices into a plurality of stacks including meat chunks of generally uniform size, the device comprising a generally rectangular container structure including a bottom and four generally upright walls for receiving said stack; a plurality of vertical slots in each of said walls, said slots being equidistantly spaced from each other whereby said slots form a plurality of pairs of slots, each pair of slots being located in a generally vertical plane disposed at a right angle with respect to the walls in which the slots of said pair are disposed, each of said slots extending over a substantial portion of the height of the respective wall; whereby the blade of a knife can be inserted to pass through both slots of each of said pairs and to be guided by same along the respective generally vertical plane as it cuts through said stack; the improvement comprising a rectangular guide plate whose perimeter generally corresponds to but is slightly less than the plan of the inside of said container; said guide plate having a bottom face provided with a plurality of straight, transversely and longitudinally disposed guide grooves equidistantly spaced from each other at a spacing corresponding to the spacing of said slots to render each of said grooves generally coincident with the respective generally vertical plane when said plate is inserted into the container.

4,056,027

CUTTING DEVICE

Tom A. Northrop, 280 Alicia Way, Los Altos, Calif. 94022

Filed June 7, 1976, Ser. No. 693,194
Int. Cl.[2] B26D *7/02*
U.S. Cl. 83—455 **4 Claims**



1. A device for cutting sheet material, comprising

means for holding the sheet material to be cut, said holding means comprising a pair of generally flat, elongated members of substantially rigid transparent material hingedly connected together at one end thereof, one said member above the other and with the longitudinally extending edges of said members being parallel, with a pin at the other end of one said member projecting outwardly of the surface of said one member facing the other said member and being receivable into a mating hole in the facing surface of said other member, whereby reception of the pin into its mating hole may effect mutual centering of the two members when the mutually facing surfaces of the members are brought together; and

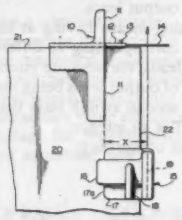
a cutting block supported for sliding movement upon the upwardly facing surface of the upper said holding member, said block having an upper portion comprising a member of transparent material extending across said upper holding member upwardly facing surface and having side portions extending downwardly of said holding member surface and adjacent and parallel said holding member longitudinally extending edges to generally adjacent the downwardly facing surface of said upper holding member for guiding movement of said block longitudinally of said holding member, said cutting block further including a cutting blade affixed to a first said side portion parallel to and between said first side portion and the adjacent said holding member edge, said cutting blade projecting below the downwardly facing surface of said upper holding member, whereby sheet material to be cut may be held between the facing surfaces of the holding members and aligned with the edge thereof by visual inspection through the transparent material and then may be cut or scored by moving the cutting block along the upper holding member with the blade contacting the sheet material while being guided by the holding member edge thus to provide a straight line cut or score in the sheet material, with the transparent cutting block upper portion providing for continuous observation of the alignment of that material during such cutting.

4,056,028

APPARATUS FOR GUIDING A PORTABLE POWER-SAW

G. Keith Patterson, 322 Boler Road, London, Ontario, Canada (N6K 2K2)

Filed May 12, 1976, Ser. No. 685,893
Claims priority, application Canada, June 4, 1975, 228471
Int. Cl.[2] B27B 9/04
U.S. Cl. 83—745 14 Claims



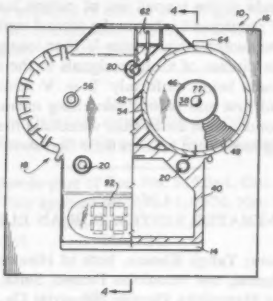
1. Apparatus for guiding a portable power-saw during sawing of a workpiece, said apparatus comprising a guide member having at least one flat surface and a straight saw-guiding edge adapted for placement upon said workpiece and a rod-holding member located on said flat surface of said guide member, said rod-holding member provided with releasable clamping means for securely supporting and holding a rod to extend from said saw-guiding edge of said guide member at a selected angle thereto, said rod formed from a material which is capable of being severed by a portable power-saw and said holder being structured to permit said rod to be placed closely adjacent and parallel with or flush against an edge of said workpiece to be sawn with the saw-guiding edge of said guide member overlying said workpiece member.

4,056,029

ELECTRICALLY ACTUATED POWER PRESS

Norman R. Doherty, 870 Main St., Farmingdale, N.Y. 11735, and Richard F. Doherty, 61 Lion Lane, Westbury, N.Y. 11590

Filed Apr. 29, 1976, Ser. No. 681,693
Int. Cl.[2] B26D 5/08
U.S. Cl. 83—575 31 Claims



1. A power pack for use with a die set having a first nonmovable die set portion and a second die set portion that is movable relative to the first portion as well as to at least one elongated, magnetizable leader pin, said power pack comprising the combination of:

a. a housing adapted to be secured to said second die set portion, said housing being arranged to move together therewith;

b. annular coil means having a bore therein, said coil means being mounted in said housing with at least a portion of the leader pin being located in said bore of said coil means when said housing is secured to the second portion of the die set; and

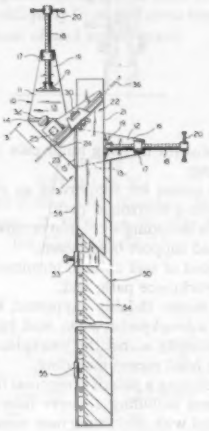
c. means for connecting said coil means to a source of electrical energy.

4,056,030

COMBINED MITER BOX, CORNER CLAMP AND MEASURING GAUGE

Roy C. Hahn, Bensenville, Ill., assignor to Hahn Manufacturing Co., Franklin Park, Ill.

Filed Oct. 26, 1976, Ser. No. 735,427
Int. Cl.[2] B27B 21/08
U.S. Cl. 83—762 6 Claims



1. A combined miter box, corner clamp and measuring gauge device for producing rectangular frames from trim strips, comprising

a. an integral support having two outwardly extending arms diverging perpendicularly from each other and an integral supporting ledge extending therebetween,

b. straight vertically upstanding shoulders at the junctions of the inner ends of said arms and ledge, said shoulders extending in planes perpendicular to each other with a gap at their adjacent ends for accommodating a cutting saw blade therebetween,

c. internally threaded lugs at the outer ends of said arms, each provided with a threaded adjusting screw with operating means therefor at the outer end and a clamping jaw at the inner end for cooperative action with a respective shoulder to clamp a trim strip therebetween,

d. said integral ledge having a channel in the top thereof along a line bisecting the right angle between the longitudinal axes of said arms and below said gap for allowing movement of said cutting saw blade below the upper surfaces of said arms incidental to the angular cutting of the trim strips adapted to rest on said arms,

e. a unitary saw guide assembly and support means therefor on said ledge at one side of said channel for detachably setting the cutting saw blade in overlying relation to said channel and gap, and

f. a rectilinear measuring gauge detachably connected to an outer edge of one of said arms for measuring the length of the trim strip from the vertical plane containing said bisecting line.

4,056,031

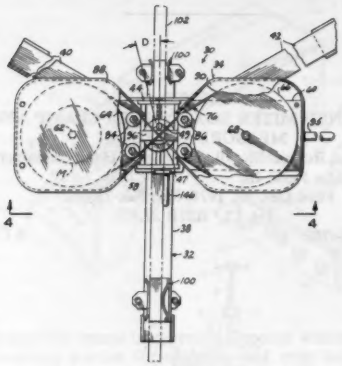
TRUSS WEB CUTTER

Jack L. Thornton, P.O. Box 213, Pacific Grove, Calif. 93950

Filed Oct. 12, 1976, Ser. No. 731,602

Int. Cl.[2] B27B *13/00*; B27M *3/04*

U.S. Cl. 83—794 **7 Claims**



1. An apparatus for forming miter cuts on the ends of truss webs, comprising:

support base means for supporting an elongated plank-like workpiece in a horizontal path;

column means including a column normally supported vertically by said support base means,

the upper end of said column terminating below the horizontal workpiece path; and,

cutter head means slidably supported by said column for acting on a workpiece when said cutter head means is moved vertically across the workpiece path,

said cutter head means including,

a frame including a pair of horizontal frame base members,

sleeve means including a sleeve interposed between and connected with said frame base members and surrounding the upper end portion of said column,

a spring retainer overlying and secured to the upper end of said column,

spring reel means including an elongated spring band secured to said frame base members adjacent said column,

said spring reel means including an elongated band having one end secured to said spring retainer for normally maintaining the upper end of said sleeve adjacent said spring retainer,

said base frame members having frame uprights mounted thereon and terminating at their upper ends in a horizontal plane spaced above the workpiece path,

a pair of pulleys journalled by said frame uprights in a generaly horizontal plane,

an endless band saw blade substantially describing a figure eight and entrained around said pulleys with the point of intersection of the crossed portions of the blade coaxially aligned with the vertical axis of said column, and,

a motor drivably connected with one said pulley.

4,056,032

MUSICAL APPARATUS

Donald K. Coles, 2505 Capital Ave., Fort Wayne, Ind. 46806

Filed Apr. 23, 1976, Ser. No. 679,814

Int. Cl.[2] G10H *1/00*

U.S. Cl. 84—1.01 **6 Claims**

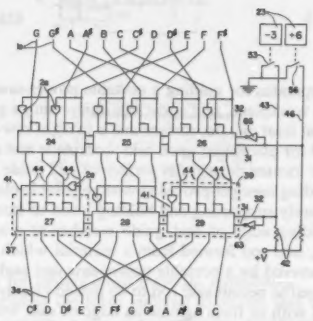
1. In a muscial instrument, improved apparatus for changing absolute pitch of the musical output, the apparatus having:

at least thirteen circuits generating individual electrical tone signals fluctuating at audio frequencies, said tone generator circuits arranged in a single sequence proceeding from low frequency to high frequency with intertone musical intervals of a single semitone between consecutive members of the sequence; and

first switching means having a first set of at least thirteen input leads and a first set of at least twelve output leads, the individual input leads receiving fluctuating electrical signals from said individual tone generator circuits, the number of switch input leads being greater than the number of switch output leads.

said first switching means having at least first and second switch states corresponding to different absolute pitches at the output leads, the absolute pitches of all tone signals at the first set of output leads being uniformly T semitones higher in the second switch state than in the first switch state, where T is an integer;

the improvement comprising;



second switching means having a second set of at least twelve input leads and a second set of at least eight output leads, the number of switch input leads being greater than the number of switch output leads, individual members of the second set of input leads receiving individual fluctuating electrical signals from individual members of the first set of output leads,

said second switching means having at least first and second switch states corresponding to different absolute pitches at the second set of output leads, the absolute pitches of all tone signals at the second set of output lead being uniformly V semitones higher in the second switch state than in the first switch state, where V is an integer;

the absolute pitches of all tone signals at the second set of output leads being uniformly T + V semitones higher when said first and second switching means are both in their second switch states than when said first and second switching means are both in their first switch states.

4,056,033

TONE GENERATOR SYSTEM FOR AN ELECTRONIC ORGAN

Michihiro Inoue; Takeji Kimura, both of Hirakata; Masaharu Sato, Moriguchi, and Masahiko Tsunoo, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 14, 1975, Ser. No. 622,383

Claims priority, application Japan, Oct. 18, 1974, 49-120763; Oct. 18, 1974, 49-120806; Oct. 23, 1974, 49-122663; Nov. 18, 1974, 49-132981; Nov. 19, 1974, 49-133991; Apr. 18, 1975, 50-47740

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.24 **12 Claims**

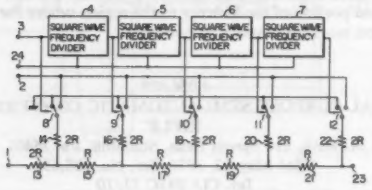
1. A frequency dividing circuit for a saw-tooth wave and a staircase wave for use in a tone generator system of an electronic organ wherein said tone generator system includes an original source for providing a square wave signal and a saw-

tooth or a staircase wave signal, said frequency dividing circuit comprising:

square wave frequency divided means having an input terminal to recieve the square wave signal from said original signal source and generating frequency divided square wave signals respectively having repetition periods which are even multiples of the repetition period of the input square wave signal, said input square wave signal having a repetition period of two times that of said original saw-tooth signal;

means for supplying a constant voltage;

electronic switching means connected to said square wave frequency divider means and said constant voltage supplying means, said switching means including a plurality of electronic switches which respectively, in response to said frequency divided square wave signals, intermittently pass said constant voltage for providing square wave signals having a constant amplitude; and



combining means connected to said switching means comprising an R-2R ladder network including a series of R resistors having 2R resistor branches connected thereto, said R-2R ladder network having one end supplies with said original saw-tooth wave signal or staircase wave signal through a 2R resistor, a free end of a 2R resistor branch at the lowest order position being supplied through said switching means with a square wave signal having a repetition period two times as large as that of said original saw-tooth wave signal, the free ends of other 2R resistor branches at sequentially higher order positions respectively being supplied through said switching means with the square wave signals having repetition periods respectively four, eight, . . . times as large as that of the original saw-tooth wave signal,

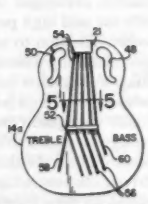
whereby the original saw-tooth wave signal is combined with the square wave signals each having a period which is an even multiple of that of said original saw-tooth wave signal at the combination ratios of 1, 2, 4, ... of the square wave signals with respect to the saw-tooth wave signal.

4,056,034

GUITAR CONSTRUCTION

Charles H. Kaman, Prattling Pond Road, Farmington, Conn. 06032

Continuation-in-part of Ser. No. 515,364, Oct. 16, 1974, abandoned. This application Apr. 21, 1976, Ser. No. 679,039
Int. Cl.² G10D *1/08*
U.S. Cl. 84—267 **12 Claims**



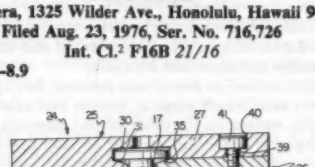
1. A guitar having a hollow body portion and a neck portion the lower end of which is attached to and extends upwardly from said body portion so that the upper end of said neck is adapted to support the upper ends of the guitar strings, said body portion including a sound board with interior and exterior surfaces, a bridge mounted to said sound board for supporting the lower ends of the guitar strings so that the string vibrations are transmitted to the sound board, said sound board having a longitudinal axis coincident with said neck portion, said sound board having a bass and a treble side located on either side of said longitudinal axis, said sound board also including upper and lower bouts defining a waist therebetween, and said bridge located below said waist in said lower bout, a bass and treble sound opening in said upper bout, said openings located in laterally spaced relationship with respect to the longitudinal axis of said sound board, said sound board comprising bracing secured to its interior surface, said bracing including a plurality of longitudinally extending stringers arranged generally symmetrically and between said sound board openings and a cross brace located behind said bridge, said stringers extending upwardly from said cross brace to the lower end of said guitar neck, and at least one sound board stiffener extending obliquely from said cross brace into the bass side of the lower bout of said sound board.

4,056,035

STUD LOCK

Benny Centera, 1325 Wilder Ave., Honolulu, Hawaii 96822

Filed Aug. 23, 1976, Ser. No. 716,726
Int. Cl.² F16B *21/16*
U.S. Cl. 85—8.9 **1 Claim**



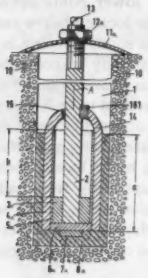
1. A stud lock for retaining a hanging article on a stud having a generally flat disk shaped head and a stem having a reduced diameter, comprising, first and second body members which may be selectively connected together, said first body member including a generally cylindrical outer portion and an integral generally semicylindrical inner portion, said inner portion having a diametrically disposed shoulder, said outer portion including a cylindrical recess having a diameter greater than the diameter of the head of said stud and having a depth greater than the thickness of the head of said stud, said semicylindrical inner portion having a substantially semi-frusto-conical shoulder for guiding the head of said stud into said recess, said semicylindrical inner portion having an axially disposed semicylindrical groove extending from said semi-frusto-conical shoulder to the exterior surface of said inner portion, said second body member having a flat semicylindrical configuration with a diametrically disposed shoulder for complementary abutting relationship with the shoulder of said first body member, said second body member having an axially disposed semicylindrical groove, said semicylindrical grooves of said first and second members cooperating with each other to define a bore of a size to freely rotatably receive the stem of said stud, screw means for securing said first and second body members in assembled relationship with each other, and said first body member having a radially disposed opening for receiving a tool to prevent rotation of said first body member when said screw means is being applied or removed.

4,056,036

BOREHOLE ANCHOR

Günther Kamann; Jürgen Krabe; Ulf Zischinsky, and Wilhelm Götze, all of Essen, Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed Mar. 17, 1976, Ser. No. 666,633
Int. Cl.[2] F16B *13/04, 31/02*
U.S. Cl. 85—63 22 Claims



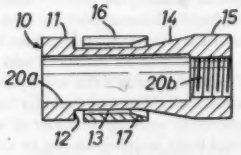
1. An anchor assembly for mounting in a borehole in a rock, said assembly comprising:
an outer element defining an axis;
means for securing said outer element proximal to the mouth of said borehole;
an inner element limitedly axially displaceable relatively to said outer element through a predetermined axial distance;
means for securing said inner element in said borehole distal from the mouth of said borehole;
a friction surface on one of said elements having a predetermined axial length equal at least to said axial distance;
a friction surface on the other of said elements transversely engageable with said surface of said one element and displaceable axially therealong through said distance; and
means pressing said surface of said other element transversely against said surface of said one element with a predetermined constant force for interconnecting said inner and outer elements and allowing limited mutual axial shifting thereof through said distance without disconnection only on axial stressing of said elements relative to each other beyond a predetermined limit.

4,056,037

EXPANDING BOLT-LIKE FASTENING MEANS

Douglas Owen McIntyre, Royston, England, assignor to Dom Holdings Limited, Royston, England

Filed Feb. 17, 1976, Ser. No. 658,684
Claims priority, application United Kingdom, Feb. 14, 1975, 6362/75
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—74 4 Claims



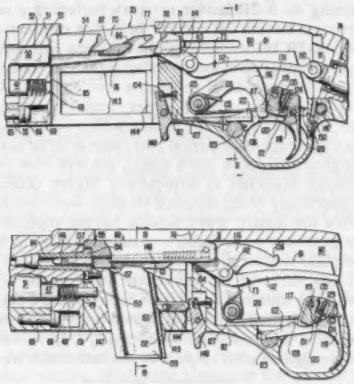
1. Bolt fastener means for locking engagement in a socket comprising an elongated cylinder-like member with a bore and a collar element loosely fitted on said member; said member comprising an inner end portion and an outer end portion of equal diameter and a waisted portion formed between said inner end portion and said outer end portion, the waisted portion further comprising a cylindrical portion of lesser diameter than said end portions and an abutting, axially-extending conical portion, the cylindrical portion extending from a radially directed shoulder formed on said outer end portion, the conical portion being convergent in a direction away from said inner end portion and leading to the cylindrical portion; said collar element being of one piece and retained loosely on said waisted portion of the fastener between said shoulder and said inner end portion of the fastener and adapted for radial expansion into engagement with the socket by having at least one slit therein which extends axially from that end of the collar which is adjacent to the said conical portion, the collar further having an inner diameter which, before the radial expansion, is less than the greatest diameter of the conical portion; said bore being of stepped diameter and extending axially throughout the length of the fastener, said stepped bore consisting of a plain bore and of a screw threaded bore of less root diameter than the diameter of the plain bore, the screw threaded bore extending through the inner end portion of the fastener and the plain bore extending through the outer end portion and the waisted portion of the fastener to the region where the conical portion meets the inner end portion.

4,056,038

DUAL PURPOSE SEMI-AUTOMATIC CONVERTIBLE RIFLE

Hans M. Rath, 116 Sproul Lane, Staunton, Va. 24401

Filed May 12, 1976, Ser. No. 685,651
Int. Cl.[2] F41C *21/10*
U.S. Cl. 89—128 8 Claims



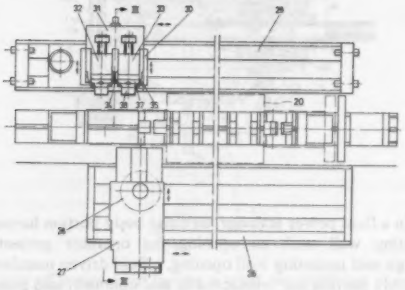
1. A dual purpose convertible rifle comprising a receiver adapted selectively to hold a locking bolt assembly and a magazine for high powered center fire cartridges and a non-locking blow-back bolt for low powered rimfire cartridges and an adapter for the rimfire cartridges, said adapte being unitary and comprising a holder body for a rimfire cartridge magazine including a latching means for such magazine and a forward chamber extension for rimfire cartridges insertable into an existing chamber of the rifle for said high powered center fire cartridges, a firing mechanism common to said high powered and low powered cartridges including a housing mountable in said magazine and including a magazine latch engaging and releasably securing said magazine for high powered cartridges within the receiver and also engageable with said latching means for said rimfire cartridge magazine to activate the latter, a gas operated actuator means on the rifle ahead of the receiver including a rearwardly driven element adapted to strike said locking bolt assembly through an open forward passage of the receiver, and a member on said adapter for rimfire cartridges in the path of movement of said rearwardly driven element to disable said gas operated actuator means when said adapter for rimfire cartridges is in the receiver.

4,056,039

DEVICE FOR MACHINING WINDING SLOTS OF GENERATOR ROTORS

Kurt Bäuml, Nurtingen; Otto Ch. Gunsser, Zizishausen, and Rudolf K. Lohse, Nurtingen, all of Germany, assignors to Gebruder Heller Maschinenfabrik GmbH, Nurtingen, Germany

Filed Mar. 19, 1975, Ser. No. 560,177
Claims priority, application Germany, Oct. 19, 1974, 2449772
Int. Cl.[2] B23D *37/06;* H02K *15/02*
U.S. Cl. 90—92 8 Claims



1. Apparatus for finish machining winding slots cut in a generator rotor workpiece comprising, in combination, clamping means for clamping the workpiece in a number of index positions corresponding to the number of winding slots, a tool, including a plate-shaped support having a longitudinal rim, first and second rows of cutting edges mounted on the longitudinal rim of the plate, the cutting edges of each row being disposed linearly one behind the other and displaced with respect to each other by one depth of cut in a direction normal to the cutting direction, the first row of cutting edges protruding in one direction from the plate and the cutting edges of the first row being directed in one direction, the second row of cutting edges protruding in the opposite direction from the plate, and the cutting edges of the second row being directed in the opposite direction to the cutting edges of the first row, at least one tool slide, means for guiding the tool slide in a select rotor slot in the longitudinal direction with respect to the workpiece, the tool slide having means for holding the tool during cutting, and copying means including at least one template for controlling the depth the tool extends into the select rotor slot and the depth the tool penetrates vertically to at least one wall of the select rotor slot, the tool slide further including a first operating element, the tool slide guiding means further including a second operating element at each end, the first and second operating elements cooperating together at a first end of the guiding means to bring the first row of cutting edges into engagement with the workpiece, and at a second end of the guiding means to bring the second row of cutting edges into engagement with the workpiece and to cause the copying device to change the depth of penetration of the tool into the workpiece.

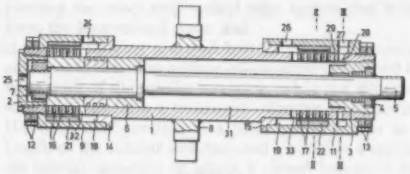
4,056,040

SHOCK ABSORBER

Hubert Fussangel, Am Hoverkamp 52, Kaarst, Germany

Filed Apr. 16, 1975, Ser. No. 568,390
Claims priority, application Germany, Apr. 20, 1974, 2419118; Feb. 15, 1975, 2506451
Int. Cl.[2] F15B *15/22*
U.S. Cl. 91—25 8 Claims

1. A shock absorber assembly having variable damping characteristics comprising: main cylinder means defined by peripheral wall means; piston means axially slidably mounted within said main cylinder means and movable relative thereto under the influence of pressure fluid within said main cylinder means; flow means for effecting pressure fluid flow to and from said main cylinder means to control relative movement between said piston means and said main cylinder means; said flow means including means defining openings in said peripheral wall in flow communication with said main cylinder means, said openings being axially spaced apart from each other along said peripheral wall in positions in which said openings are successively passed over to be closed and opened by said piston means during movement thereof relative to said main cylinder means; and adjustment means for varying fluid flow thrugh said openings to provide adjustment of said damp-



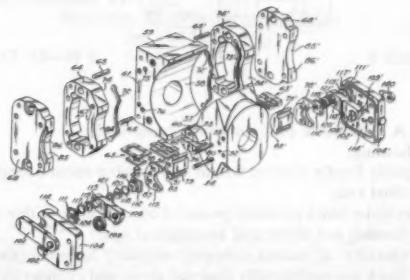
ing characteristics of said shock absorber assembly, said adjustment means comprising outer cylindrical means rotatably mounted relative to said main cylinder means and spaced radially therefrom, and arcuate adjustment elements comprising substantially crescent-shaped sections mounted upon said outer cylinder means for rotation therewith relative to said main cylinder means, said crescent-shaped sections having surface means extending eccentrically relative to said main cylinder means and over said openings to adjustably vary the flow path through said openings upon rotation of said outer cylindrical means relative to said main cylinder means.

4,056,041

CONTROL SYSTEM FOR AXIAL PISTON FLUID ENERGY TRANSLATING DEVICE

Ellis H. Born; William H. Meisel, and Alan H. Viles, all of Columbus, Ohio, assignors to ABEX Corporation, New York, N.Y.

Division of Ser. No. 494,677, Aug. 2, 1974, Pat. No. 3,967,541.
This application Mar. 1, 1976, Ser. No. 662,300
Int. Cl.[2] F15B *9/10;* F16K *1/6, 51/00*
U.S. Cl. 91—375 R 10 Claims



1. A control device for a fluid motor having a movable fluid motor member, comprising an input member for setting the desired position of said fluid motor, a valve shoe having a pressure fluid supply port and carried by said input member, a flat valve plate having a pair of fluid receiving ports, passage means for connecting both of said fluid receiving ports to said fluid motor, said input member being alternatively movable between a first position in which said fluid supply port is aligned with one of said fluid receiving ports to thereby move said movable fluid motor member in one direction, a second position in which said fluid supply port is aligned with the other of said fluid receiving ports to thereby move said mov-

able fluid motor member in another direction and a null position in which said fluid supply port is misaligned with both of said fluid receiving ports and said fluid motor is inoperative, said valve plate being movable in direct response to movement of said movable fluid motor member to misalign said fluid receiving ports and said fluid supply port when said fluid motor reaches the position set by said input member, and differential area means on said valve shoe responsive to fluid pressure to move said shoe away from said valve plate a predetermined distance to permit limited fluid flow therebetween and thus create a hydrostatic bearing.

4,056,042

ROTARY HYDROSTATIC PISTON MACHINE WITH ECCENTRICALLY MOVABLE GUIDE MEANS

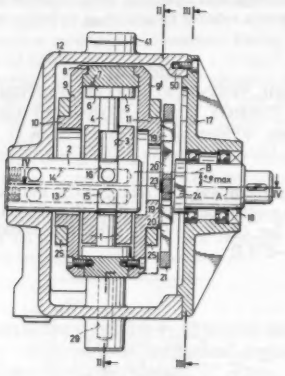
Peter Rutz, Winterthur, and Anton Steiger, Illnau, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 22, 1976, Ser. No. 668,970

Claims priority, application Switzerland, Apr. 2, 1975, 4143/75

Int. Cl.[2] F01B *1/06, 13/06*

U.S. Cl. 91—497 7 Claims



1. A hydrostatic piston machine comprising

a housing;

a pintle fixedly secured within said housing about a longitudinal axis;

a cylinder block rotatably mounted on said pintle within said housing and about said longitudinal axis;

a plurality of pistons movably mounted in said cylinder block and peripherally disposed about said cylinder block, each said piston having a support surface at an outer end;

a guide member mounted about said cylinder block about a second longtudinal axis, said guide member having a plurality of plane guide surfaces disposed tangentially to a circuilar cylindrical surface normally eccentric to said axis of said cylinder block, each said guide surface having a support of a respective one of said pistons guided thereon;

a movable guide means within said housing mounting said guide member therein for varying the eccentricity of said guide member axis to said pintle axis; and

means on said guide member for supplying and/or taking-off the torque of the machine.

4,056,043

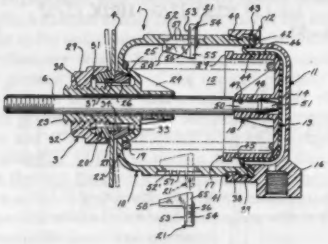
FLUID POWER PISTON ACTUATORS

Durvasula V. Sriramamurty, Milwaukee, and Donald E. Brzezinski, Brookfield, both of Wis., assignors to Johnson Controls, Inc., Milwaukee, Wis.

Filed Oct. 28, 1975, Ser. No. 625,823

Int. Cl.[2] F15B *15/24*

U.S. Cl. 92—13.2 18 Claims



1. In a fluid power actuator, an outer body portion having a mounting wall with an opening, an operator projecting through said mounting wall opening, a fluid driven member in said body portion and connected to said operator, said mounting wall further including an annular recess encircling said opening, said recess defining a spherical chordal section having a spherically shaped sidewall with an outer circular opening to the recess of a diameter less than the diameter of a sphere generated by the full development of the spherically shaped sidewall, an annular mounting means clamped within said recess and having a central opening for the operator and an outer periphery defining a central sector of said sphere, said central opening having a diameter greater than the operator and being spaced from said operator and permitting movement of the mounting means independently of the body portion and the operator, a clamping means secured to said body portion in spaced relation to said mounting wall, said clamping means having a spherical chordal sector generally corresponding to and coaxially aligned with said spherical chordal sector defined by said recess and operable to firmly clamp the mounting means in position for supporting of the actuator, wherein said annular mounting means is a two-piece member having a pair of similar ring members with internal slot and projections defining a snap-joint connection of the ring members.

4,056,044

OIL COOLED PISTON

Kenneth R. Kamman, Edelstein, and Wayne D. Jacobson, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 12, 1975, Ser. No. 631,247

Int. Cl.[2] F01B *31/10*

U.S. Cl. 92—159 6 Claims

1. A piston assembly comprising:

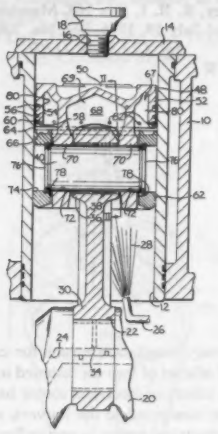
a generally cylindrical piston body having a crown, a depending, relatively short ring land and a central cavity;

seal receiving groove means in said ring land adapted to receive sealing rings;

a generally cylindrical skirt body having an end in proximity to said ring land and aligned with said piston body; and

an annular, imperforate groove in said end opening into said central cavity for receiving a lubricant draining from said central cavity and for splashing the lubricant, during reciprocation of said piston, against the interior of said ring land to cool the same in the vicinity of said groove means;

said skirt body including a cross bore for receiving a wrist pin and said piston body including a depending rib and a



pair of bosses each having a wrist pin receiving aperture aligned with said cross bore.

4,056,045

PRODUCTION OF BAGS FROM A PANEL OF SHEET MATERIAL

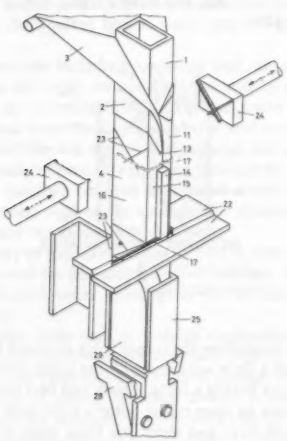
Hans Heinzer, Beringen, and Werner Müller, Neuhausen am Rheinfall, both of Switzerland, assignors to S I G Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Aug. 30, 1976, Ser. No. 719,057

Claims priority, application Switzerland, Aug. 28, 1975, 11183/75

Int. Cl.² B31B *1/86*

U.S. Cl. 93—35 SB **13 Claims**



1. In a method for producing bags in succession from an elongate panel of flexible sheet material having parallel longitudinal edges, which method includes: advancing the panel in the direction of its length between a shaping tube having a rectangular cross section and extending in the direction of panel advance and a folding box surrounding a portion of the length of the shaping tube, to fold the panel into a tubular structure of rectangular cross section with the longitudinal edges of the panel overlapping; joining the longitudinal edges of the panel together to form a longitudinal seam of the tubular structure; forming a closed bottom at the leading end of the tubular structure, which is the leading end with respect to the direction of advance of the panel; and severing a portion of the tubular structure having such closed bottom to provide a bag which is open at its top and to establish a new leading end of the tubular structure at the plane of severance, the improvement wherein:

said step of joining the longitudinal edges of the panel together comprises applying a longitudinal bead of adhesive material along one of the longitudinal edges and then pressing the other longitudinal edge against that bead to form the longitudinal seam; and

said step of forming a closed bottom comprises: applying adhesive to the outer surface of one narrow side and both wide sides of the tubular structure, while the structure is stationary, to form a transverse adhesive bead having a U-shaped configuration in a plane perpendicular to the length of the tubular structure and located in a region of the tubular structure at which a closed bottom is to be formed; and, in sequence, folding a portion of the one narrow side at the leading end of the tubular structure inwardly to lie in a plane perpendicular to the length of the tubular structure, folding a corresponding portion of the other narrow end inwardly to lie in the same plane as the folded portion of the one narrow side, to cause the other narrow side to contact the base of the U-shape defined by the transverse adhesive bead and to be attached thereby to the one narrow side, said steps of folding the narrow sides imparting to the corresponding portions of the wide sides of the tubular structure the form of ears each composed of two layers of sheet material, the layers of each ear being fastened together by a portion of a respective arm of the U-shape defined by the transverse adhesive bead, and folding the ears in succession against the folded narrow side portions in a manner to cause the ears to be fastened together and to the folded narrow side portions by the end portions of the arms of the U-shape defined by the transverse adhesion bead.

4,056,046

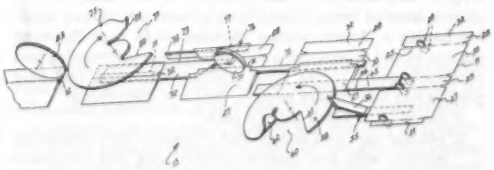
APPARATUS FOR FOLDING AND GLUING CARTON BLANKS

Charles C. Hughes, Ludlow, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed May 27, 1976, Ser. No. 690,644

Int. Cl.² B31B *1/56*

U.S. Cl. 93—49 R **8 Claims**



1. Apparatus for folding and gluing a blank into a carton having two outboard panels, two inboard panels and a glue flap at the edge of one outboard panel adhesively secured to the edge of the opposite outboard panel, said panels and glue flap being defined by fold lines, said apparatus comprising,

a conveyor for feeding carton blanks in a direction parallel to their folded lines,

a first rotatable plow on one side of said conveyor for folding said glue flap and outboard panel over upon said one outboard panel,

conveyor means on the other side of said conveyor opposite said first rotatable plow for tightly gripping the upper and lower sides of said one outboard panel to convey said blank past said first rotatable plow while holding said blank securely in longitudinal alignment,

means downstream of said rotatable plow for applying glue to said glue flap,

a second rotatable plow located downstream of said glue-applying means and on the opposite side of said conveyor from said first rotatable plow for folding said opposite outboard panel on the other side of said blank over upon said blank with an edge portion overlying the glue flap of the first panel,

conveyor means securely gripping the upper and lower surfaces of said folded blank and located on the side of said conveyor opposite to said second rotatable plow to securely grip said blank and maintain it in longitudinal alignment,

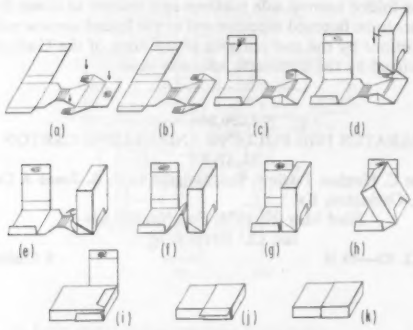
and means downstream of said rotatable plow for pressing said edge portion and glue flap together.

4,056,047

METHOD AND APPARATUS FOR ASSEMBLING A PACKAGE

Wolfgang H. Grimm, Richmond, Va., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed May 14, 1976, Ser. No. 686,578
Int. Cl.² B31B *13/00*
U.S. Cl. 93—49 M **44 Claims**



1. A method of assembling a package comprised of an open-topped receptacle and a slide-actuated closure member, said closure member being formed from a blank, said closure member having a closure portion disposed to fit over the open portion of said receptacle, a slide portion for surrounding said receptacle and a rolling hinge portion connecting said slide portion and said closure portion, the steps comprising:

a. moving said blank along a path;

b. placing the open end of said receptacle into contacting relation with said closure portion with said receptacle extending generally normally from said path;

c. affixing portions of said blank to said receptacle;

d. moving said hinge portion out of the plane of said path;

e. rotating said receptacle into a contacting relation with said rolling hinge portion and said slide portion;

f. wrapping said slide portion around said receptacle; and

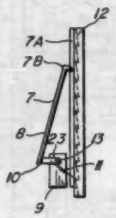
g. affixing said slide portion around said receptacle to allow reciprocating movement of the slide portion toward and away from said open portion of said receptacle.

4,056,048

EMERGENCY VENTILATION MEANS FOR CONFINED LIVESTOCK AREAS

Robert W. Milroy, R. R. 1, Box 168, Manchester, Iowa 52057

Filed July 19, 1976, Ser. No. 706,844
Int. Cl.² F24F *11/02*
U.S. Cl. 98—41 R **2 Claims**



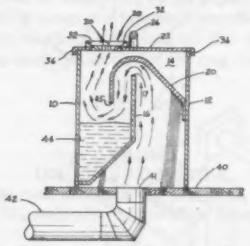
1. An emergency ventilation means for confined livestock areas comprised of a set of louvers fastened together in moving relation to each other, an electrical motor having a high gearing ratio, an arm connected to the louvers, a strip connecting the arm to the electrical motor, a spring loading between the strip and a frame for the louvers to immediately open the louvers when electrical power is lost, the electrical motor having a stop thereon to prevent the electrical motor from distorting the louvers as the louvers reach a normally closed position.

4,056,049

SPACE HUMIDIFIER

Milton C. Stuckey, Rte. No. 6, Box 241A, Macon, Ga. 31201

Filed July 1, 1976, Ser. No. 701,904
Int. Cl.² F24F *13/06*
U.S. Cl. 98—105 **6 Claims**



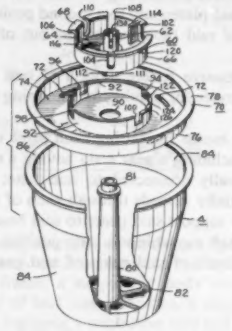
1. A space humidifier for humidifying air being forced into a room through a floor vent and with the space humidifier comprising a casing having a front, a back and two sides extending upwardly about an open casing bottom sized to be seated upon the room floor over and about the floor vent; a lid having a vent mounted atop said casing; a partition extending upwardly within said casing between said two casing sides; a reservoir within said casing to one side of said partition below said lid vent; an air shaft within said casing to the oter side of said partition opposite said one side; and baffle means for deflecting air rising from said air shaft downwardly into said reservoir and then upwardly out of said casing through said lid vent including a baffle mounted within said casing extending between the top of said partition and said lid.

4,056,050

COFFEEMAKER WITH BREW STRENGTH CONTROL

Richard N. Brown, Macungie, Pa., assignor to General Electric Company, Bridgeport, Conn.

Filed Dec. 22, 1976, Ser. No. 753,557
Int. Cl.[2] A47J *31/44*
U.S. Cl. 99—305 9 Claims



1. In an electric coffeemaker wherein a ground coffee basket having side wall means, bottom wall means and brewed coffee aperture means in said bottom wall means is positioned above a brewed coffee container and a heated water outlet is positioned above the ground coffee basket for providing heated brewing water to the ground coffee basket the improvement comprising:

a. by-pass passage means extending upwardly from the bottom wall means of said coffee basket for by-passing heated brewing water to said brewed coffee container;

b. a heated water spreader positioned generally above said ground coffee basket for receiving heated brewing water and for distributing heated water into the ground coffee basket;

c. said spreader including a bottom wall, an upwardly extending side wall, an aperture for said by-pass passage means, an upwardly extending heated water control wall positioned between the aperture for said by-pass passage means and the side wall of the spreader, and a plurality of heated water openings extending through the bottom wall of said spreader between the heated water control wall and the side wall of the spreader for distributing heated water into the ground coffee basket;

d. a plurality of spaced openings formed in said heated water control wall for permitting heated brewing water to flow to the heated water openings in the bottom wall of the spreader;

e. a movable slide wall in slidable engagement with said control wall positioned between said control wall and the aperture for receiving said by-pass passage means; and

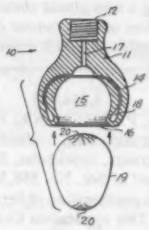
f. a plurality of spaced openings formed in said slide wall positioned for selective registry with one, or more of the spaced openings formed in said control wall so that movement of said slide wall with respect to said control wall will uncover one, or more of the openings in said control wall to permit more or less heated water to flow through said control wall and through the heated water openings in the bottom wall of the spreader to control the relative amount of water which is permitted to flow through the coffee basket and the by-pass passage means to thereby control the strength of the liquid brewed coffee in the coffee container.

4,056,051

HARD BOILED EGG EXTRACTOR

Ernest A. Brown, 410 W. Clark St., Springfield, Ohio 45506

Filed Aug. 25, 1976, Ser. No. 717,613
Int. Cl.[2] A23B *4/08, 4/12;* A23N *5/00;* A47J *17/00*
U.S. Cl. 99—516 2 Claims



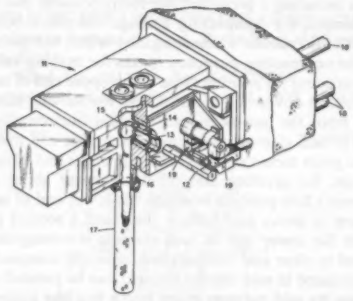
1. A hard boiled egg extractor comprising a semi-sperical holder composed of an elastic material, curved sides and an open end on said holder to receive a hard boiled egg having holes in each end of its shell, means for attaching said holder to a source of pressure, means for conducting the pressure to the center of the holder including a pressure passage in the curved walls of the holder whereby said pressure flexes said walls and thereby holds the egg shell as the pressure expels the egg from the shell.

4,056,052

METHOD FOR SHEARING SPENT NUCLEAR FUEL ASSEMBLIES

Bradley S. Weil, Oak Ridge, and Clyde D. Watson, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 29, 1976, Ser. No. 681,648
Int. Cl.[2] B30B *13/00*
U.S. Cl. 100—39 5 Claims



1. A method for shearing elongated spent nuclear fuel assemblies of the shrouded tube-bundle type into short segments for subsequent dissolution of contained fuel values comprising:

a. reducing the cross section of the fuel assembly by progressively pressing it between opposed movable and stationary gags defining a compression zone which progressively changes in cross section from that of the uncompressed fuel assembly to a cross section having a substantially reduced area relative to the cross section of the uncompressed fuel assembly which defines a non-planar contour for engagement by a shearing blade; said fuel assembly being advanced in a stepwise manner through said compression zone with said movable gag being periodically disengaged to permit such advancement and then engaged with said assembly in a compression stroke to compress

said fuel assembly upon completion of said advancement; and

b. shearing segments from the compressed end of said assembly by driving a shearing blade against said compressed end at a point immediately adjacent said compression zone while said movable gag is engaged with said assembly following completion of a compression stroke, said shearing blade having a non-planar shearing face contoured to match that portion of the contour of the compressed end of said fuel assembly which it engages.

4,056,053

COMPACTORS, PARTICULARLY FOR GARBAGE

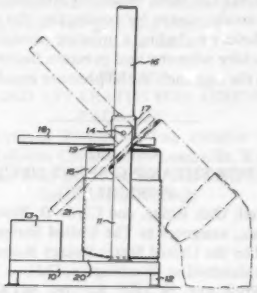
Olof Robert Wilhelm Åkerberg, Vetlanda, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation-in-part of Ser. No. 558,369, March 14, 1975, abandoned, which is a continuation of Ser. No. 353,085, April 20, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 622,071

Claims priority, application Sweden, Apr. 24, 1972, 5343/72

Int. Cl.² B30B *15/32*

U.S. Cl. 100—218 **2 Claims**



1. A compactor, particularly for garbage, comprising a support, a tubular element mounted on said support, pressing means including a pressure plate reciprocatable into said tubular element, for compacting garbage therein, a bottom plate beneath said tubular element against which the pressure plate acts for compacting purposes, means for moving said pressure plate to occupy a position close to the upper end of said tubular element, to cover said element, and for moving said pressure plate from the last-mentioned position horizontally with respect to said element to uncover the upper end thereof, horizontal pivot means arranged near the upper end of said tubular element, for pivoting said tubular element about said pivot between a first position in which the lower end of said tubular element is above said bottom plate and a second position in which the lower end of said element is swung-out laterally thereof to clear said bottom plate, whereby compacted matter accumulated in said tubular element can be pressed out of said element by said pressure plate, into a bag-like means disposed over the lower end of said tubular element.

4,056,054

CREDIT CARD IMPRINTER

Richard B. Feldman, San Mateo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 19, 1976, Ser. No. 715,808

Int. Cl.² B41F *3/04*

U.S. Cl. 101—45 **4 Claims**

1. A credit imprinter adapted to prevent errors due to failure to reset said imprinter after a prior transaction, comprising:

a base including a first area for printing a transaction form and a second area having at least one row of data values printed thereon;

a platen, movable in a path across said base from an initial position to an extreme position and back to said initial position to form a printing cycle;

a platen roller rotatably supported by said platen;

a plurality of settable print wheels pivotally supported by said base and located in said printing area;

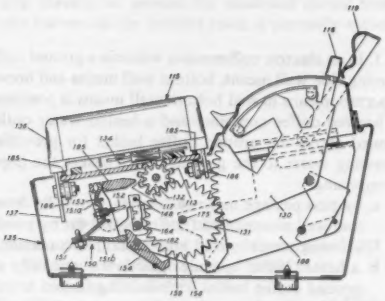
blocking means movable into the path of said platen so as to prevent movement of said platen to said extreme position;

stopping means controllably associated with said blocking means, said stopping means being movable to a first position to effect positioning of said blocking means in the path of said platen and to a second position to effect positioning of said blocking means out of the path of said platen;

means responsive to the motion of said platen through a printing cycle for moving said stopping means to said first position;

positioning means for setting each print wheel to a desired setting including a gear train having a set of gears which are pivotally connected to said base; and a first shaft which axially extends through each of said gears so as to pivotally support said gears to said base;

a second shaft movable to a stop position between adjacent teeth of each of said gears of said gear train while said



stopping means remains in said first position and said platen remains in a locked position after said platen moved from initial position, across said printing area and returns to the initial position;

a pair of toggle arms having an interconnecting toggle joint wherein a first one of said toggle arms is pivotally connected to said first shaft for keeping said gears in axial alignment;

a second one of said toggle arms having a slot wherein said second shaft has one end slidably located therein;

a rod connected to one end to said pair of toggle arms so that substantially all of an actuating force which causes said rod to move is transferable to said pair of toggle arms which in turn moves said second shaft allowing said stopping means to move in said second position so as to permit said platen to be movable over said printing area;

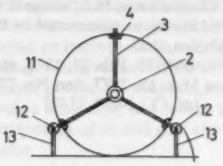
a reset handle for introducing said actuating force, said handle rotatably connected to said rod and to said base, said handle for resetting all of said print wheels at once to a reference datum while said rod transfers a force through said toggle arm so as to relocate said second shaft from its stop position, permitting said platen to be relocated over said plurality of number wheels to record the data on said number wheels on another transaction form.

4,056,055

ROTARY SCREEN SUPPORTING AND TENSIONING MEANS

Johannes Zimmer, Ebentalerstrasse 133, A-9020 Klagenfurt, Austria

Filed Dec. 29, 1975, Ser. No. 645,230
Claims priority, application Austria, Dec. 30, 1974, 10368/74; Oct. 2, 1975, 7555/75
Int. Cl.[2] B41F *15/38*
U.S. Cl. 101—128.1 10 Claims



1. A rotary printing machine, comprising a cylindrical stencil; an end ring connected at each end to said cylindrical stencil, a supporting frame; a supporting body carried by said frame at each end of said stencil and each supporting body comprising rollers engaging a respective said end ring to guide and tension the stencil; each said supporting body further comprising a center element and radially diverging arms extending from said center element, the rollers of each supporting body being mounted at the extremities of said arms, at least one of said rollers of each supporting body being movable from its operating position for releasing said end rings.

4,056,056

ROTARY PRINTING PRESS

Gualtiero Giori, Lonay, Switzerland, assignor to De La Rue Giori S.A., Switzerland

Continuation-in-part of Ser. No. 452,385, March 18, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 643,532
Claims priority, application Switzerland, Mar. 21, 1973, 4082/73
Int. Cl.[2] B41F *9/02, 11/00*
U.S. Cl. 101—152 8 Claims

1. A combined rotary printing press for printing on sheet material, said press comprising an offset printer and a direct plate printer arranged in tandem,

said offset printer comprising a blanket cylinder, a plate cylinder cooperating with said blanket cylinder to apply an image thereto and a first impression cylinder comprising a steel cylinder for pressing said sheet material against said blanket cylinder to transfer said image to said sheet material,

said direct plate printer comprising a plate cylinder, inking means for applying ink to a plate on said plate cylinder and a second impression cylinder for pressing said sheet material against a plate cylinder to print said sheet material,

said first and second impression cylinders being independently adjustable to provide optimum contact pressure,

feed means comprising a first conveyor drum for feeding said sheet material to said blanket cylinder of said offset printer at a position in advance of and spaced from said first impression cylinder in proper registration with said image on said blanket cylinder, and transfer means comprising a second conveyor drum for transferring said sheet material from said offset printer to said direct plate printer,

said first and second conveyor drums being spaced from and independent of said first impression cylinder,

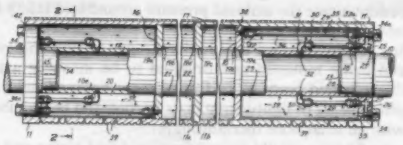
whereby said first impression cylinder is adjustable to obtain optimum contact pressure without disturbing registration of said sheet material with said image on said blanket cylinder.

4,056,057

VACUUM PRINTING CYLINDER CONSTRUCTION

Earl R. Smith, Ashway, R.I., assignor to Livermore and Knight Co., Inc., Palm Beach, Fla.

Filed Feb. 27, 1976, Ser. No. 661,841
Int. Cl.[2] B41F *27/12;* B25B *11/00*
U.S. Cl. 101—382 MV 12 Claims



1. A vacuum-operated printing cylinder, which comprises

a. a shaft,

b. a cylinder sleeve surrounding and supported on said shaft to form a cylindrical structure wherein the annular region between said shaft and said cylinder sleeve forms a vacuum chamber,

c. a pre-evacuation chamber internal of said cylindrical structure,

d. first air passage means connected to said pre-evacuation chamber for application of vacuum thereto,

e. valved air passage means interconnecting said vacuum chamber and said internal pre-evacuation chamber,

f. a valve operator located externally of said printing cylinder and associated with said valved air passage means for selectively controlling the valved air passage means, whereby said vacuum chamber is isolated from said internal pre-evacuation chamber and the vacuum effect of the pre-evacuation chamber may be immediately applied to said vacuum chamber by the selective operation of said valved air passage means, and

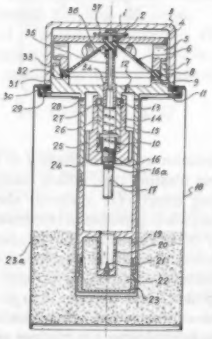
g. second air passage means providing vacuum communication between said vacuum chamber and the exterior of said cylinder sleeve.

4,056,058

SAFETY FUSE FOR UNDERWATER ARTEFACTS

Fernando Almarza Laguna de Rins, Parlo Marina Moreno 8, Zaragoza, Spain

Filed Apr. 21, 1976, Ser. No. 679,050
Claims priority, application Spain, Apr. 24, 1975, 436905
Int. Cl.[2] F42B *22/36*
U.S. Cl. 102—16 14 Claims



1. Safety fuse for underwater artefacts, comprising:

a body having an open end; a valve head closing said body open end; said valve head being secured to said body;

a diaphragm located in and sealingly dividing said body into a primary and a secondary chamber; said diaphragm being

deformable to change the relative sizes of said primary and secondary chambers; said diaphragm having an annular peripheral flange which is secured inside said valve head; said diaphragm having a generally conical shape with a central portion projecting further into said valve head than said diaphragm peripheral flange;

passages into said valve head from the exterior of said body and communicating into said primary chamber, thereby to communicate the ambient pressure around said safety fuse into said primary chamber;

a first piston attached to said diaphragm to shift therewith and being mounted and oriented to be movable axially through said body as said diaphragm deforms; said first piston being of lightweight construction and being tubular with an axial bore therethrough;

a second piston axially spaced from said first piston and also being positioned and oriented to be axially movable through said body; a compressible spring between said first and said second pistons, which is compressed as said first piston is moved toward said second piston by said diaphragm;

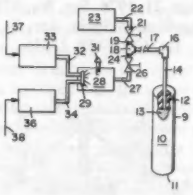
restraining means for restraining motion of said second piston under the influence of said spring; release means connectable with said first piston and located for releasing said restraining means once said first piston has moved a predetermined distance toward said second piston;

a detonator connectable with said second piston to be moved by said second piston; impact means in said body to be impacted upon by said detonator and spaced from said detonator as said second piston is restrained by said restraining means, such that release of said restraining means and of said detonator enables said detonator to impact against the cooperating said impact means to initiate detonation of a charge.

4,056,059
CLOSED INITIATOR SYSTEM INCLUDING EXPLOSIVE ENERGY-INITIATABLE BLASTING CAPS, AND METHOD

David T. Zebree, Kingston, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 30, 1976, Ser. No. 710,058
Int. Cl.[2] F42B *3/10*; F42D *1/04*
U.S. Cl. 102—22 R 20 Claims



1. A closed initiator system including at least one non-electrically initiatable blasting cap, which comprises:

as said blasting cap(s), (1) a closed shell, (2) an ignition charge in said shell ignitable in response to action of explosive energy of an explosive gas mixture, and (3) conduit means communicating the interior of said shell with the exterior thereof and opening in said shell in operative relationship with said ignition charge therein to convey resident non-explosive gas being removed from said shell and convey an explosive gas mixture as a confined stream from outside said shell into position therein for explosion and responsive ignition of said ignition charge;

separate means outside said shell connecting through said conduit means for (1) removal of at least a portion of resident non-explosive gas from said shell, (2) subsequent emplacement of said explosive gas mixture in said position for explosion of same, and (3) for then igniting said explosive gas mixture when so emplaced; and

said conduit means and said shell of said blasting cap(s) disposed in gas-tight relationship with the other and with said means for removal of said non-explosive gas and subsequent emplacement of said explosive gas mixture and said means for igniting said mixture.

4,056,060
ARMOR PLATE PENETRATOR

Patrick J. Devine, Cinnaminson, N.J., assignor to The Government of the United States, as represented by the Secretary of the Army, Washington, D.C.

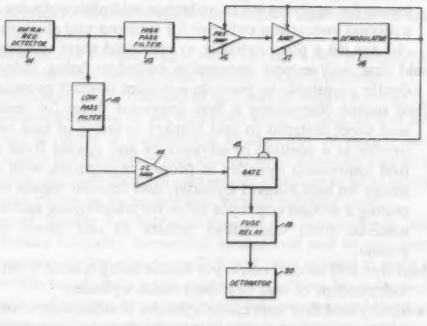
Division of Ser. No. 660,526, Feb. 23, 1976, abandoned. This application Mar. 10, 1977, Ser. No. 776,342
Int. Cl.[2] F42B *13/06*
U.S. Cl. 102—52 5 Claims

1. In an armor piercing round having a case wall including propellant therewithin and a projectile disposed at a forward portion of said case wall, said projectile including a penetrator or core therewithin, said projectile being carried by a nondiscarding sabot, said sabot having a windshield associated therewith, and means for igniting said propellant within said case for propelling said projectile forwardly with said sabot and windshield form said case at a high rotational speed, in combination therewith, the improvement comprising said penetrator having a non-circular transverse cross-section throughout its length and a predetermined center of gravity and weight, said nondiscarding sabot having an internal configuration mating generally with the exterior configuration of said non-circular transverse cross-section penetrator, and said non-circular transverse cross-section penetrator having an axis and comprising a plurality of plates, each of said plates extending from said axis and being equal to each other and spaced from each other by an equal number of degrees.

4,056,061
PROXIMITY FUSE

Orville A. Becklund, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 20, 1959, Ser. No. 788,019
Int. Cl.[2] F42C *13/02*
U.S. Cl. 102—70.2 P 3 Claims



1. An infrared proximity fuse comprising means to transduce infrared radiation intensity into the amplitude of an electrical

signal, first circuit means including a low pass filter connected to a filter substantially all frequencies except DC from said electrical signal, thus generating a DC output signal, second circuit means including a high pass filter connected to filter substantially all low frequencies from said electrical signal, thus generating an AC output signal, a demodulator having as its input said AC output signal from said second circuit means to produce a DC signal corresponding to the amplitude of said AC output signal, a gate circuit means having as inputs said DC output signal from said first circuit means and said DC signal corresponding to the amplitude of said AC output signal, said gate circuit means having means to generate an output signal solely during an interval when said DC output signal is above a maximum preset level and said DC signal corresponding to the amplitude of said AC output signal is below a minimum preset level, a detonator, and means responsive to production of the output signal of said gate circuit means to energize said detonator.

4,056,062

MAGAZINE FOR CASELESS CHARGES

Karl Walser, Nendeln, Liechtenstein; Kurt Schmid, Altenstadt, Austria, and Ralph Scotoni, Triesen, Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Continuation of Ser. No. 438,677, Feb. 1, 1974, abandoned. This application July 26, 1976, Ser. No. 708,303

Claims priority, application Germany, Feb. 2, 1973, 2305219

Int. Cl.² F42B *39/08*

U.S. Cl. 102—86.5 **8 Claims**

1. A magazine for use in an explosive powder driven bolt setting gun comprising a substantially flat band-shaped magazine body having a first substantially flat face surface and a second substantially flat face surface oppositely directed from said first face surface, a cartridge recess formed in said magazine body extending inwardly from said first face surface, a torus-shaped wall mounted on and extending outwardly from the first face surface of said magazine body and encircling the recess and forming in combination therewith a cartridge holding space, wherein the improvement comprises a caseless charge held in the cartridge holding space defined by said cartridge recess and torus-shaped wall with said caseless charge disposed in surface contact with the annular surface within said cartridge recess and the inner surface of said torus-shaped wall which extends transversely of said first and second face surfaces, said caseless charge being capable of generating explosive gases when ignited for driving a bolt from a setting gun into a receiving material, said cartridge recess being closed by the second face surface of said magazine body and the base of said recess closed by said magazine body being a planar surface and having a projection extending outwardly therefrom in said cartridge holding space with said projection being spaced inwardly from the annular surface within said cartridge holding space which extends transversely of said first and second face surfaces and with which said caseless charge is in surface contact, said projection having a free end surface spaced from the base of said recess and located inwardly from the outer end of said cartridge holding space defined by said torus-shaped wall.

4,056,063

DISPATCHER FOR CONVEYOR SYSTEM

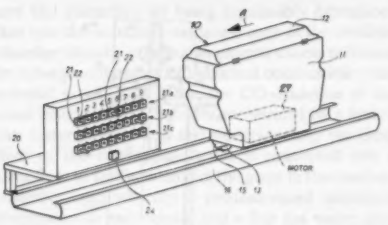
Bruno Ritter, Malente Gremsmuhlen, Germany, assignor to Buro Patent AG, Glarus, Switzerland

Continuation of Ser. No. 599,053, July 25, 1975, abandoned. This application Jan. 4, 1977, Ser. No. 756,611

Claims priority, application Germany, July 27, 1974, 2436376

Int. Cl.² B61J *3/00*

U.S. Cl. 104—88 **10 Claims**



1. A dispatching apparatus for a conveyor system having a plurality of cars displaceable along a track and each having a side provided with a plurality of parallel guides each in turn receiving a respective code marker slidable along the respective guide and arrestable therein at any of a plurality of predetermined index positions, whereby the pattern defined by said markers in said positions determines the path of travel of the respective car on said track, said apparatus comprising:

a support fixed adjacent said track;

a plurality of rows of encoders on said support, each row being alignable with a respective guide on a one of said cars and each encoder being alignable with a respective position on the respective guide, each encoder having a remotely operable abutment member projectable from said support into the respective guide, whereby displacement of a car past a support having one such member of each such row projecting from said support automatically displaces the respective markers along the respective guides; and

means for displacing said abutment members and said side apart to disengage same when the guides of the car align with the rows of the support.

4,056,064

TRANSVERSELY REMOVABLE GANTRY LOADER

Herbert Geoffrey Bottomley, Skipton, England, assignor to Landis Lund, Limited, Keighley, England

Continuation of Ser. No. 555,318, March 4, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,668

Claims priority, application United Kingdom, Mar. 9, 1974, 10646/74

Int. Cl.² E01B *25/22*

U.S. Cl. 104—93 **5 Claims**

1. A gantry loader comprising

a horizontally disposed support beam,

a railway rail secured to said support beam, said rail including a straight portion terminating in a head having an end face extending substantially perpendicularly to said straight portion and opposing portions projecting in a direction parallel to said end face outwardly beyond said straight portion, and having substantially flat surfaces parallel to said straight portion,

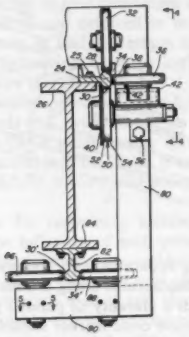
a loader assembly including a carriage selectively displaceable along said beam, said carriage having

a first wheel mounted for rotation about an axis parallel to said straight portion and having a substantially flat surface for rollingly engaging the flat surface of one projecting portion of said head,

a second wheel mounted for rotation about an axis perpen-

dicular to said straight portion for rollingly engaging the face of said rail head,

a third wheel mounted for rotation about an axis parallel to said straight portion for rollingly engaging the flat surface of the other projecting portion of said head, said third wheel including a peripheral step having a base portion selectively facing the flat surface of said other projecting portion and having a side wall surface for rollingly engaging the side of said head opposite from said end face,



said third wheel being selectively displaceable in a plane perpendicular to its axis from a retracted position remote from said rail whereat said loader assembly can be transversely displaced away from said rail to an advanced position whereat the base and side wall surface of said step engage said other projecting portion to prevent the disassociation of said loader assembly from said rail, and

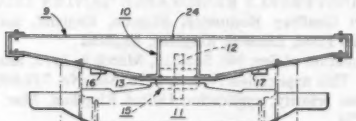
means for selectively maintaining said third wheel at said advanced position.

4,056,065

REJECTION FEATURE FOR CENTER PLATE

David Elmer Fiegl, Williamsville; Vaughn Terrey Hawthorne, East Amherst, and Albert Edward Martin, Lancaster, all of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 19, 1976, Ser. No. 733,971
Int. Cl.[2] B61C *9/48*
U.S. Cl. 105—199 C **9 Claims**



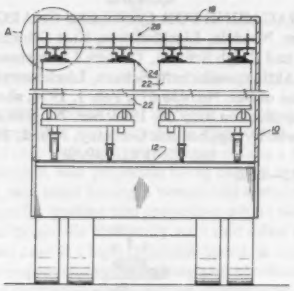
1. In a body bolster center plate assembly for a railway car comprising in combination a center sill having walls contiguously arranged generally U-shaped in cross section and forming a centrally open interior; body bolster of longitudinal extent having a centrally defined laterally extending opening receiving said center sill intersecting therewith; shear plates longitudinally spaced apart secured within said sill interior to the walls thereof, at least one of said plates being located on each side of the center of intersection between said bolster and sill; said shear plates and portion of said sidewalls included therebetween defining a generally rectangular bottom-open pocket in which to receive a center plate; a center plate having a first portion of exterior dimension greater than said pocket for extending outward of the underside thereof and connecting with a second portion of reduced exterior dimension received within said pocket; and means securing the center plate to the underedge of said pocket walls forming a fixed rigid structure thereat, said center plate being detachable upon removal of said means; the improvement comprising said centerplate and said shear plate containing means for polarizing said center plate within the bottom-open pocket. Wherein the polarizing means on said shear plates is at least one stop lug disposed on the interior surface thereof for permitting the center plate to be installed in only two proper positions within the bottom-open pocket.

4,056,066

DISPLACEABLE CEILING MOUNTED CARGO RESTRAINT SYSTEM

George Homanick, Lathrup Village, Mich., assignor to PepsiCo Inc., Purchase, N.Y.

Filed Mar. 15, 1976, Ser. No. 667,155
Int. Cl.[2] B61D *45/00*
U.S. Cl. 105—493 **14 Claims**



1. In a cargo restraint arrangement for an enclosed truck body having a cargo-supporting floor structure and a roof structure, said floor structure being adapted to have bulk cargo conveyed and stored thereon, the improvement comprising: generally horizontally extending vertically displaceable rigid planar means being disposed below said roof structure, said planar means extending along a longitudinal length of said truck body and positioned at predetermined locations above said bulk cargo; means connecting said planar means to said roof structure for vertical movement relative thereto; said connecting means including resiliently yieldable means for normally biasing said planar means upwardly towards said roof structure; expandable means being interposed between said roof structure and the upper surface of said planar means, said expandable means being normally compressed intermediate said roof structure and the upper surface of said planar means responsive to the upward biasing force of said resiliently yieldable means; and actuating means for pressurizing and expanding said expandable means during predetermined time periods for forceably moving said planar means downwardly towards said bulk cargo into resilient pressure engagement therewith so as to restrain the latter from movement within said truck body.

14. In a method for the transport of goods racked or stacked in tall upright wheeled carriers supported upon a platform forming a cargo-supporting floor of an enclosed truck body having a roof structure, the improvement which comprises resiliently engaging the uppermost portions of said carriers with normally upwardly biased rigid planar contact means suspended from said roof structure for vertical displacement relative thereto, and applying downwardly directed pressure through the interposition of expandable means between said roof structure and said planar contact means sufficient to engage and lockingly urge said carriers into a fixed and stable position against and upon said platform for transport, releasing the pressure engagement of said contact means for allowing movement of the said carriers on said truck platform and

reengaging said contact means in the same manner for continued transport of the truck while the carriers are maintained in a fixed position on the truck platform.

4,056,067

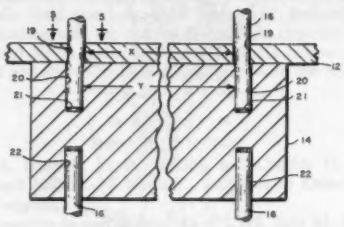
JOINT FOR MODULAR FURNITURE

Thomas C. Steger, Goose Hill Road, Chester, Conn. 06412

Filed June 7, 1976, Ser. No. 693,474

Int. Cl.[2] A47B *57/00, 87/00*

U.S. Cl. 108—101 **3 Claims**



1. A multishelf structure comprising shelves containing at their opposite ends spaced vertically disposed holes, and means for supporting the shelves in spaced parallel relation, one above another, said means comprising spaced parallel columns at the opposite ends of the shelves, said columns extending continuously from the underside of one shelf upwardly through the holes in the one shelf to the underside of the shelf above, but not into the holes therein, and locking means comprising a block at each end of each shelf having contact with the lower side of the shelf, said blocks containing at their upper and lower sides spaced holes offset outwardly with respect to the holes in the shelves, the holes in the top side receiving the portions of the columns extending downwardly through a given shelf and the holes in the lower side receiving the portions of the columns extending upwardly from said shelf into the holes at the lower side of the blocks at the underside of the shelf above such that the shelf at the upper side of a block bends the columns inwardly and the block at the underside of the shelf above bends the columns outwardly.

4,056,068

PROCESS FOR CONDITIONING FLUE GASES IN WASTE MATERIAL INCINERATION PLANTS WITH HEAT UTILIZATION

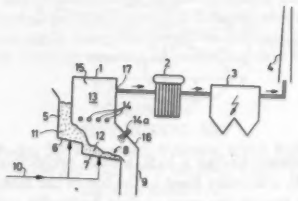
Robert Hafeli, Zurich, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed May 7, 1976, Ser. No. 684,557

Claims priority, application Switzerland, July 4, 1975, 8787/75

Int. Cl.[2] F23G *5/00*; F23L *9/04*; F23J *5/00*

U.S. Cl. 110—8 A **12 Claims**



1. A process for conditioning flue gases in waste material incineration plants with heat utilization having a combustion chamber with a combustion grate, sidewalls and a reflection wall, a flue gas cooler serving as the heat utilizer and a gas cleaner connected in series with said combustion chamber, said process comprising the steps of:

introducing secondary air into said combustion chamber above the combustion grate and before said flue gas cooler at a plurality of injection points located at the same height through at least one of the two furnace sidewalls and through said reflection wall; and

spraying water into said flue gases to moisten them before they enter said flue gas cooler at said plurality of injection points;

said water and secondary air being regulatably introduced together into the reduction-oxidation zone of the combustion chamber thereby creating an oxygen excess sufficient for the subsequent burning of unburned combustible volatile material in said flue gases, the CO-oxidation of the unburned material is catalytically accelerated by a homogeneous water gas reaction and simultaneously the laminar flow of the gases is converted into a turbulent flow to facilitate mixing the gases in the combustion chamber, and whereby a predetermined maximum gas temperature is maintained, and a flue gas water content of at least 10 Vol. % is maintained prior to its discharge from the combustion chamber.

9. Apparatus for conditioning flue gases in waste material incineration plants with heat utilization having a combustion chamber with a combustion grate, sidewalls and a reflection wall, a flue gas cooler serving as the heat utilizer connected at the gas discharge of the combustion chamber, and a gas cleaner connected in series with said combustion chamber and said gas cooler, said apparatus comprising:

a conduit adapted for connection to a source of secondary air;

a conduit adapted for connection to a source of water;

at least one first mixing nozzle opening into said combustion chamber from at least one of said side walls;

at least one second mixing nozzle opening into said combustion chamber from said reflection wall, said reflection wall overlying the final combustion zone of said combustion grate; and

means for connecting both said water and secondary air conduits to said first and second mixing nozzles for injection thereof into said combustion chamber;

whereby an oxygen excess sufficient for the subsequent burning of unburned combustible volatile material in said flue gases is provided, the CO-oxidation of the unburned material is catalytically accelerated by a homogeneous water gas reaction, the laminar flow of the combustible gases is converted into a turbulent flow to facilitate mixing the gases in the combustion chamber, a predetermined maximum gas temperature is maintained, and a flue gas water content of at least 10 Vol. % is maintained prior to its discharge from the combustion chamber.

4,056,069

METHOD OF BURNING REFUSE

John Edward Marshall, Aldridge, England, assignor to Imperial Metal Industries (Kynoch) Limited, England

Filed Mar. 23, 1976, Ser. No. 669,497

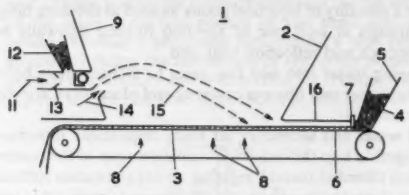
Claims priority, application United Kingdom, Apr. 7, 1975, 14144/75

Int. Cl.[2] F23G *5/08*; F23B *1/22*

U.S. Cl. 110—7 R **14 Claims**

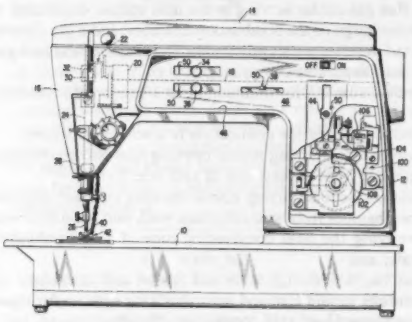
1. A method of burning refuse including the steps of establishing a substantially uniform bed of burning coal on a moving grate floor, the bed of burning coal being located at the lower end of a combustion chamber, and entraining refuse in particulate form in a gas jet directed into the combustion chamber through the back wall of the combustion chamber in the opposite direction to the direction of movement of the grate, the velocity of the gas jet being such that the heavier particles are

projected towards the front of the bed of coal, to fall onto the moving bed of coal and to be burned with the coal, while the



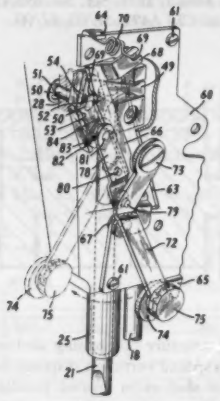
lighter particles of the refuse are burned in suspension above the moving bed of coal.

4,056,070
AUTOMATIC ONE-STEP BUTTONHOLING DEVICE
Robert Conrad Hauf, Upper Montclair, N.J., assignor to The Singer Company, New York, N.Y.
Filed Oct. 15, 1976, Ser. No. 732,683
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 B **3 Claims**



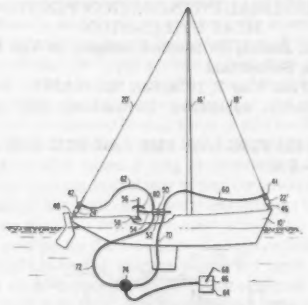
1. In a sewing machine for producing zig-zag stitching in a work piece and having a needle reciprocable in an endwise path, a mechanism for jogging said needle laterally to produce zig-zag stitches including at least one member for regulating the needle jogging motion, a work feeding mechanism including a feed regulating member having a range of position corresponding to forward and reverse direction of work feed, an actuating mechanism in said sewing machine operatively connected to impart endwise reciprocatory and lateral vibratory movements to said needle and movement to said work feeding mechanism in timed relation thereto, a presser device arranged to bear against the work piece adjacent to the path of reciprocation of said needle, a buttonholing assembly having a repetitive sequence of modes and effective in each one of said modes to influence the settings of said needle jogging and feed regulating members appropriately for the formation of a different segment of a stitched buttonhole, an indexing mechanism effective on each activation to advance said buttonholing assembly one mode in said repetitive sequence, an electrical control arrangement for said indexing mechanism comprising a circuit including an activation stage for said indexing mechanism, and gate means carried by said sewing machine presser device closely adjacent to one side of said path of needle reciprocation and effective on each closure to energize said activation stage, in combination with a pair of gate closing elements each including fastening means for temporary attachment to a work piece each to one side of the opposite extremity of the location of a buttonhole desired to be formed in said work piece.

4,056,071
COMBINATION PRESSER BAR LIFTERS AND PRESSURE CONTROLS
Kenneth Douglas Adams, Madison, N.J., assignor to The Singer Company, New York, N.Y.
Filed Oct. 26, 1976, Ser. No. 735,304
Int. Cl.[2] D05B *29/02*
U.S. Cl. 112—237 **8 Claims**



1. A presser device for a sewing machine having a frame, said presser device comprising: a presser bar supported by said frame for endwise movement; rockable means operatively connected to said presser bar for transfering selectively variable and reversible force thereto; means for creating a force for transfer to said presser bar; and, means for adjustably connecting said force creating means to said rockable means in order to obtain said variable and reversible force on said presser bar.

4,056,072
SYSTEM FOR TRIMMING THE MAST OF A SAILING YACHT
Lars Rune Bergström, Lands End, Longboat Key, Fla. 33548
Filed Aug. 30, 1976, Ser. No. 718,777
Int. Cl.[2] B63B *15/02*
U.S. Cl. 114—109 **5 Claims**



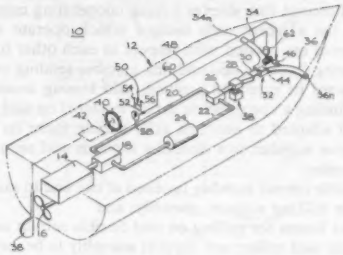
1. In a sailboat having a hull, a mast projecting upwardly from the hull, a forestay fixed to the top of the mast, an aftstay fixed to the top of the mast, a first hydraulic cylinder connected to the hull at a forward location thereof and including a piston connected to the forestay, a second hydraulic cylinder connected to an aft portion of the hull and including a piston connected to the aftstay, the improvement comprising control means simultaneously supplying one of said hydraulic cylin-

ders with fluid while exhausting the other hydraulic cylinder of fluid for moving the fore and aft stays simultaneously to trim the mast in either the fore or aft direction as desired, and wherein said control means includes a hydraulic control cylinder and first and second hydraulic fluid lines respectively interconnecting the opposite ends of the hydraulic control cylinder and said first and second hydraulic cylinders, and wherein said control cylinder includes a control piston, and wherein there is further included drive means for moving the control piston in the control cylinder for supplying and exhausting hydraulic fluid from said first and second hydraulic cylinders simultaneously, and wherein there is further included a hydraulic fluid reservoir, third and fourth hydraulic lines communicating with the control cylinder on opposite sides of said control piston and means for selectively communicating said third and fourth hydraulic fluid lines with the reservoir.

4,056,073
BOAT THRUSTER

Stanley A. Dashew, Santa Monica, and Charles D. Sutton, Woodland Hills, both of Calif., assignors to Omnithruster Inc., Compton, Calif.

Continuation-in-part of Ser. No. 491,797, July 25, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,871
Int. Cl.² B63H *25/46*
U.S. Cl. 114—151 **5 Claims**



2. In combination with a boat having a hull with bow and stern portions, the improvement comprising:

pump means mounted in said hull for pumping water; and

thruster means having a common passage coupled to said pump means, for receiving the water pumped thereby, said common passage connecting to two thruster outlet means opening to the sea at either side of the bow of the hull for discharging water into the sea thereat;

said boat hull having a recess on either side of said bow, said recess having a deep forward portion and being tapered in depth to have a progressively smaller recess depth at progressively more rearward locations;

said outlet means includes a sidewardly opening outlet at said forward portion of said recess, and said diverter means including a movable member lying in said recess, and

each of said thruster outlet means including diverter means selectively operable to assume different desired positions to direct water being discharged in different directions for position holding steering or propelling said boat.

4,056,074
HYDROFOIL KIT

Elmer B. Sachs, 3371 Rexford, Ventura, Calif. 93003

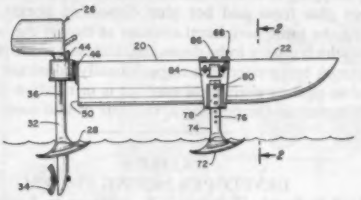
Filed Apr. 23, 1976, Ser. No. 679,772
Int. Cl.² B63B *1/26*
U.S. Cl. 114—280 **3 Claims**

1. In combination with a boat hull, a hydrofoil kit connectable with said hull, said hydrofoil kit comprising:

a first hydrofil unit connectable by first connecting means to starboard side of said hull;

a second hydrofil unit connectable by second connecting means to the port side of said hull, each said hydrofil unit including a hydrofoil member spaced below the bottom of said hull;

interconnecting means connecting said first hydrofoil unit and said second hydrofoil unit, said interconnecting means



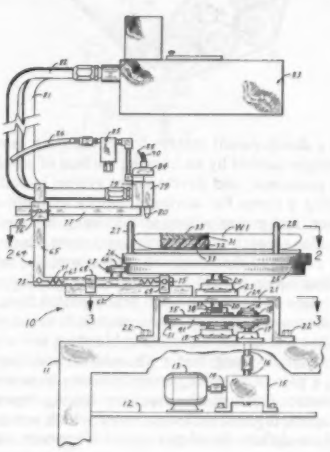
securely binding together said hydrofoil units to said hull; and

said interconnecting means including a flexible band assembly extending across the bottom of said hull, tightening means connected with said flexible band to make said flexible band taut.

4,056,075
AUTOMATIC HOT MELT ADHESIVE DEPOSITING MACHINE

Abe Seiderman, 7365 SW. 132 St., Miami, Fla. 33156

Filed Jan. 12, 1976, Ser. No. 648,141
Int. Cl.² B05C *5/00*
U.S. Cl. 118—7 **9 Claims**



1. Apparatus for automatically controlling the gravitational deposition of hot glue or the like dispensed from the nozzle of a dispensing machine and along a circuitous path upon the upper surface of a flat work-piece having an irregular curvilinear peripheral contour preparatory to its gluing assembly to a complemental member, the dispensing machine included electrical means for starting and stopping the dispensing flow of hot glue, comprising, in combination, a work table having a substantially horizontal support surface for seating the work-piece, means for positionally locating a work-piece upon said support surface, means for rotating said work table about a vertical axis, mechanism for supporting the nozzle of a hot glue dispensing machine vertically above a work-piece located on said support table, a cam fixed with respect to said work table and rotatable in unison therewith, a cam follower cooperative with said cam, said nozzle support mechanism comprising means slidably supporting said cam follower for rectilinear

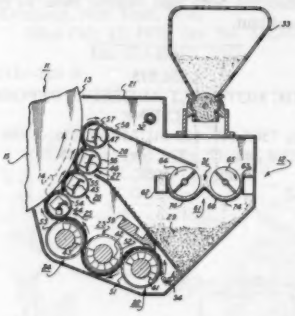
movement upon rotation of said cam, means for simultaneously initiating a rotative cycle of said work table and starting the flow of hot glue dispensd from the nozzle of the hot glue dispensing machine, and means controlled by the completion of a rotative cycle of operation of said work table for automatically stopping both the rotation of said work table and the flow of hot glue from said hot glue dispensing nozzle, said cam having the same peripheral contour as that of the work-piece upon which glue is to be deposited, and said work-piece locating means being operative to positionally constrain the work-piece so that its peripheral contour is in rotative registration with respect to the peripheral contour of said cam.

4,056,076

DEVELOPER MIXING SYSTEM

Richard E. Smith, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,134
Int. Cl.[2] G03G *15/09*
U.S. Cl. 118—653 **19 Claims**



1. In a development system for developing latent electrostatic images carried by an imaging surface of an electrostatographic processor; said development system including a housing having a sump for storing a supply of multi-component developer, and means within said housing for circulating developer along a path running from said sump, through a development zone, and then back into said sump; the improvement comprising series hybrid crossmixing means disposed in said path between said sump and said development zone, said crossmixing means including an active section in series with at least one passive section for sequentially blending and mixing developer circulating along said path, said crossmixing means including a pair of parallel passive sections in series with said active section, said passive sections having separate sets of spaced apart, internal deflector vanes which are downwardly inclined to deflect developer toward opposite sides of said housing,

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4,056,077

MILKING UNIT DETACHER MECHANISM

Gary W. Schluckbier, Madison, Wis., assignor to DEC International, Inc., Madison, Wis.

Filed July 29, 1976, Ser. No. 709,650
Int. Cl.[2] A01J *7/00*
U.S. Cl. 119—14.08 **4 Claims**

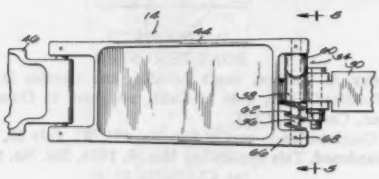
1. A milking unit detacher mechanism comprising:

a main support column;

a vertically movable milker support column movably mounted on said main support column;

a horizontally extending retractable milking unit support assembly mounted on said milker support column, said retractable milker unit support assembly adapted to support a milker unit thereon when the milker unit is connected to a cow for milking, said milker unit support assembly further adapted to be retracted from its extended position underneath the cow to a retracted position adjacent the cow, said support assembly comprising a plurality of link members pivotally connected to each other with the end link member pivotally connected to said vertically movable milker support column by a pivotal connection, said pivotal connection including a pivot pin operatively connected to said end link member;

a biasing means operatively connected to said pivotal connection between said end link member and said milker support column, said biasing means functioning to create a rotating biasing force on said end link member in a direction towards its extended milking position, said biasing means including a first cam sleeve rotatably mounted on said pivot pin and fastened to said vertically movable



support column, and a second cam sleeve fixedly mounted on said pivot pin adjacent said first cam sleeve, said first and second cam sleeves having cooperating cam surfaces on the adjacent ends thereof which operate when the sleeves are rotated with respect to each other to create a biasing force on said end link member tending to rotate it toward its extended position, said biasing means further including a compression spring mounted on said pivot pin and adapted to exert an axial biasing force on said first sleeve member in a direction towards said second sleeve member;

a flexible retract member fastened at one end to said retractable milking support assembly; and

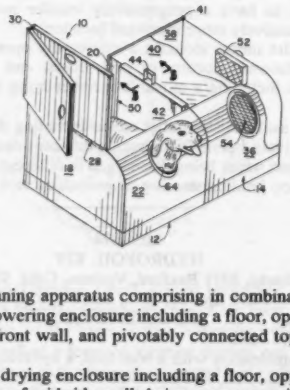
retract means for pulling on said flexible retract member to cause said milker unit support assembly to be moved from its extended position to its retracted position.

4,056,078

AUTOMATIC DOG WASHER

Clem Blafford, and Antoinette Blafford, both of 106 Bay 38th St., Brooklyn, N.Y. 11214

Filed Aug. 3, 1976, Ser. No. 711,308
Int. Cl.[2] A01K *29/00*; A61D *11/00*
U.S. Cl. 119—158 **7 Claims**



1. Dog cleaning apparatus comprising in combination:

a. a first showering enclosure including a floor, opposed side walls, a front wall, and pivotably connected top and rear walls;

b. a second drying enclosure including a floor, opposed side walls, one of said side walls being a common side wall of said first enclosure, and front, top and rear walls;

c. water spray means mounted in said showering enclosure

adapted to direct at least one stream of water onto an animal stationed therein;

d. blower means mounted in said drying enclosure adapted to direct at least one stream of heated air onto an animal stationed therein; and

e. a gate movably mounted in said common side wall manually operable from a location externally of the showering and drying enclosures for selectively providing communication between said showering and drying enclosures, the top wall of said showering enclosure being pivotably connected to the side wall thereof remote from said common side wall and the rear wall of said showering enclosure being pivotably connected to the said top wall.

4,056,079

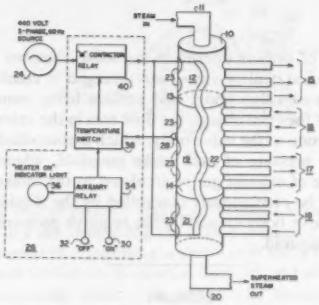
APPARATUS AND PROCESS FOR PREHEATING MAIN BOILER SUPERHEATER HEADERS

Alan Reid, Columbia, and Wendell C. Phillips, Jr., Harwood, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 30, 1976, Ser. No. 701,486

Int. Cl.[2] F22G *3/00*; F22B *37/42*

U.S. Cl. 122—476 **12 Claims**



1. A superheater header connected to the outlet of a boiler comprising:

at least one inlet for steam to enter said header;

at least one outlet for steam to exit from said header; and

means for preheating said header to a desired temperature prior to both boiler light-off and the introduction of steam into said header to prevent thermal shock to said header.

4,056,080

RECIPROCATING INTERNAL COMBUSTION ENGINE

Peter Rutz, Winterthur, and Anton Steiger, Illnau, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 26, 1976, Ser. No. 718,086

Claims priority, application Switzerland, Mar. 5, 1976, 2753/76

Int. Cl.[2] F02B *45/02, 19/04*; F02F *3/28*

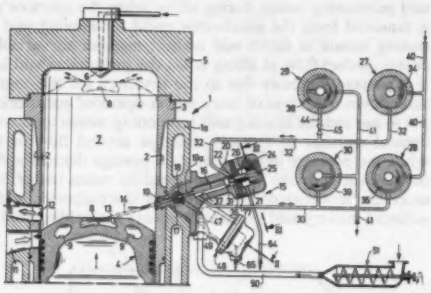
U.S. Cl. 123—23 **14 Claims**

1. In a reciprocating internal combustion engine the combination comprising

at least one cylinder having a wall defining a combustion chamber;

a piston slidably mounted in said cylinder to move into said combustion chamber during a compression stroke, said piston having a centrally disposed pocket in a surface thereof facing said combustion chamber, said pocket having an undercut portion in a peripheral surface thereof; and

a mechanical fuel dosing and ejecting means mounted on said cylinder wall for ejecting powdered fuel cyclically and tangentially into said pocket for initial collection under said undercut during a first half of said compression stroke and for release into said combustion chamber during a second half of said compression stroke under the influence of decreasing centrifugal force and increasing axial deceleration of said piston.



4,056,081

INTERNAL COMBUSTION ENGINE

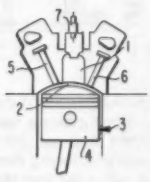
Konstantin Pattas, Thessaloniki, Greece, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed May 19, 1975, Ser. No. 578,768

Claims priority, application Germany, May 22, 1974, 2424799

Int. Cl.[2] F02B *19/08*

U.S. Cl. 123—75 B **30 Claims**



1. An internal combustion engine which includes a main combustion space means, ignition chamber means terminating in said main combustion space means, and mixture supply means for supplying a fuel-air mixture to the main combustion space means, characterized in that a further mixture supply means is provided for independently supplying a different fuel-air mixture to the ignition chamber means, and in that the fuel-air ratio of the combustion is controlled by control means in dependence on the load of the engine at least over a portion of the rotational speed range in such a manner that the fuel-air ratio is reduced with an increasing load starting from the upper boundary of a lower load range, in which an approximately constant large fuel-air ratio exists.

4,056,082

FUEL SAVING VARIABLE CLOSED POSITION FUEL AND AIR FLOW CONTROL FOR VEHICLES WITH AUTOMATIC TRANSMISSION

Douglas G. Nolles, 114 Elm Place, New Canaan, Conn. 06840

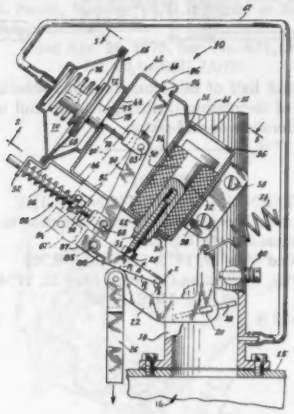
Continuation-in-part of Ser. No. 423,091, Dec. 7, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,586

Int. Cl.[2] F02D *11/08*

U.S. Cl. 123—103 R **23 Claims**

1. Apparatus for use in a vehicular engine drive system including an automatic transmission wherein air-fuel flow control means associated with an induction passage leading to the engine are provided for controlling engine power and speed with a movable control member for operating said air-fuel flow control means, said apparatus comprising a solenoid for allowing said control member to move to an engine shut

down position; positioning means for moving said control member for providing varying air-fuel flow; pressure-responsive means connected to said induction passage for controlling said positioning means during idling when the operator's foot is removed from the accelerator pedal for moving said positioning means to move said control member to variably increase air-fuel flow at idling when the pressure in said induction passage increases due to the tendency for the engine to slow down when one or more power-operated accessories are put in use and for moving said positioning means to move said control member to variably decrease air-fuel flow at idling when the pressure in said induction passage decreases due to the tendency for the engine to speed up when use of one or more power-operated accessories is discontinued; and said solenoid moving said positioning means for holding said positioning means in an operating position during engine operation and for moving said positioning means and said control member to an engine shut down position; said pressure-responsive means also controlling said positioning means during deceleration and downhill travel when the operator's foot is removed from the accelerator pedal for moving said positioning means to move said control member to decrease further the air-fuel flow when the vehicle momentum is driving the engine; whereby the position of said control member results from the sum of the control action of said pressure-responsive means plus the control action of said solenoid, thereby reducing fuel consumption by automatically controlling engine speed during idling and air-fuel flow during deceleration and downhill travel when the operator's foot is removed from the accelerator pedal and vehicle momentum is driving the engine.



4,056,083

EXHAUST GAS RECIRCULATOR FOR PURIFICATION OF EMISSION FROM AN INTERNAL COMBUSTION ENGINE

Nobuaki Wakita, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 29, 1976, Ser. No. 681,699

Claims priority, application Japan, Dec. 19, 1975, 50-172053[U]

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **4 Claims**

1. An exhaust gas recirculator for purification of emission from an internal combustion engine, comprising:

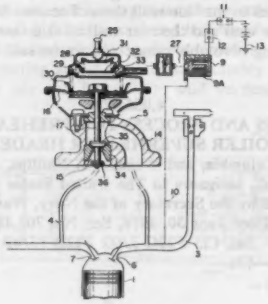
a cylinder;

an intake manifold connected to said cylinder;

an exhaust pipe;

an exhaust gas recirculation pipe connected between said intake manifold and said exhaust pipe;

a recirculation control valve inserted midway in said exhaust gas recirculation pipe, which has a diaphragm, a diaphragm chamber provided at one side of said diaphragm and connecting to said intake manifold, a valve body configured substantially as a truncated cone and connected to said diaphragm, and a plurality of springs provided in series in said diaphragm chamber and working such reaction force on said diaphragm as varies phasedly in accordance with the displacement of said valve body; and



a plurality of orifices opened in the valve chamber of said recirculation control valve, and arranged in combination around said valve body, said orifices being constituted such that they can change the flow area in the valve-opening direction of the valve body, which is controlled by the negative pressure of said intake manifold, whereby the flow rate of exhaust gas recirculated to the intake manifold can be continuously controlled by the displacement of the valve body caused by the negative pressure of the intake manifold.

4,056,084

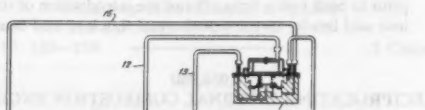
APPARATUS FOR RECYCLING EXHAUST

Hans Baumgartner, Viersen, Germany, assignor to A. Pierburg Autogeratebau KG, Neuss, Germany

Filed June 24, 1976, Ser. No. 699,635

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **11 Claims**



1. Apparatus for recycling exhaust gas for an internal combustion engine having inlet and outlet manifold, said apparatus comprising an EGR-valve including a plurality of diaphragms defining first and second chambers separated by one diaphragm, the second chamber being a working chamber, means for subjecting said first chamber to suction pressure prevailing in the inlet manifold of the engine, a pressure converter having a first inlet connected to the inlet manifold for being subjected to the suction pressure therein, a second inlet connected to the inlet manifold for being subjected to a control suction pressure, an outlet connected to said working chamber of the EGR-

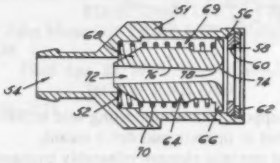
valve and valve means for selectively connecting the outlet to said second inlet in accordance with the suction pressure prevailing at said first inlet, said EGR-valve further comprising recycle means coupled to said inlet and outlet manifolds for recycling engine exhaust gases, and coupling means between said diaphragms and said recycle means for controlling the operation of said recycle means in accordance with the pressures in said chambers such that at low engine loads the amount of recycled gas is proportionately reduced in relation to engine air-fuel mixture rate to provide a lower ratio of recycled fuel to mixture rate at low loads as compared to the ratio at high loads.

4,056,085

ENGINE POSITIVE CRANKCASE VENTILATION VALVE ASSEMBLY

Alvin P. Nowroski, Livonia, and Lyman V. Root, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 18, 1976, Ser. No. 697,497
Int. Cl.² F02M *25/06*; F02F *9/00*
U.S. Cl. 123—119 B **6 Claims**



1. An engine positive crankcase ventilation valve assembly for use in a line connecting the engine crankcase to the engine intake manifold, comprising, a sleeve type valve body having a valve seat formed on its internal diameter and slidably receiving a regulating valve of lesser diameter therein to define a flow annulus therebetween, the valve being axially movable against and away from the valve seat in response to manifold vacuum acting thereon to control variably the flow of crankcase vapors and gases to the intake manifold through the annulus, spring means biasing the valve towards a fully open position away from the valve seat in opposition to manifold vacuum acting on the valve to close the valve, and sonic flow control means extending through the valve to permit at least a minimum flow at a constant rate through the valve during all partial load conditions to always maintain a predetermined constant rate of flow of vapors and gases to the intake manifold.

4,056,086

METHOD OF ACCELERATING EVAPORATION OF FUEL IN INTERNAL COMBUSTION ENGINE INTAKE SYSTEM BY HEAT EVOLVED BY DECOMPOSITION OF H_2O_2 AND APPARATUS FOR SAME

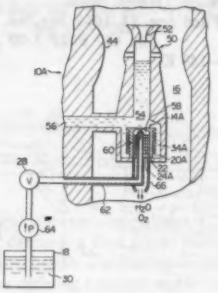
Zene Ueno, Fuchu; Katuaki Kosaka, Hidaka, and Fumio Wagatsuma, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 20, 1975, Ser. No. 606,214
Claims priority, application Japan, Aug. 21, 1974, 49-95816
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 R **23 Claims**

1. A method of accelerating evaporation of a liquid fuel in an intake system of an internal combustion engine said intake system having fuel introduced into a flow of air to prepare a combustible mixture, comprising the steps of:

subjecting hydrogen peroxide to catalytic decomposition in a reaction vessel thereby to produce oxygen and water with evolution of heat; and

transferring the heat of decomposition to at least one component of said combustible mixture within the intake system



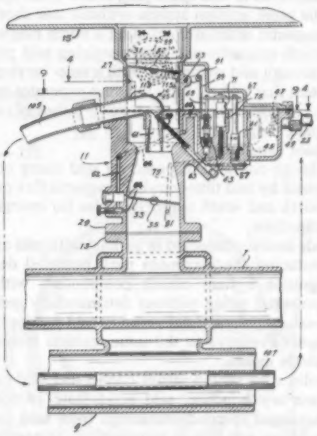
before said combustible mixture is admitted into the combustion chambers of the engine.

4,056,087

TWO-FUEL CARBURETOR

Leonard D. Boyce, Kirkwood, Mo., assignor to F. Travers Burgess, Kirkwood, Mo.

Filed Mar. 26, 1976, Ser. No. 670,718
Int. Cl.² F02M *13/04, 31/00*
U.S. Cl. 123—127 **10 Claims**



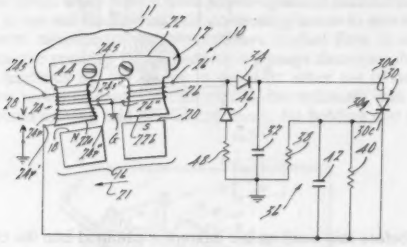
1. In a carburetor for an internal combustion engine, an intake conduit, a pair of separate liquid chambers each having an outlet below the normal liquid level therein, separate normally open metering valves respectively controlling said outlets responsive to fuel requirements of the engine, a shut-off valve separate from said metering valves controlling one of said outlets independently of the respective metering valve, means controlling said shut-off valve responsive to engine temperature to maintain said shut-off valve closed during cold starting of the engine when the engine temperature is below a predetermined value and to open said shut-off valve during normal operation of the engine when the engine temperature equals or exceeds such predetermined value, and separate passage means connecting said outlets to the intake conduit and having discharge means thereinto at a level above the liquid level in said chambers.

4,056,088

IGNITION SYSTEM

Thomas F. Carmichael, Drayton Plains, Mich., assignor to Syncro Corporation, Oxford, Mich.

Filed Apr. 12, 1974, Ser. No. 460,271
Int. Cl.[2] F02P 3/08
U.S. Cl. 123—148 E **2 Claims**



1. A capacitor discharge ignition system for delivering a secondary potential to a spark plug and incorporating circuit components with limited peak potential rating comprising:

an ignition coil having a primary and a secondary winding coil for connection to a spark plug,

a stator core on which said primary and secondary windings are disposed,

a shorted winding on said stator core for reducing the maximum peak potential delivered to said ignition system circuit components with limited peak potential rating without detrimentally reducing said secondary potential delivered to said spark plug at low rotor speeds relative to the same ignition system without said shorted winding,

a magnetic structure including a north magnetic pole and a south magnetic pole for energizing said primary winding through said stator core with a time-varying magnetic flux such that said primary winding generates an output waveform which includes repetitive pulses of one polarity,

a spark plug,

a main capacitor,

a charge coil also disposed on said stator core being energized by said time-varying magnetic flux provided by said north and south magnetic poles for energizing said main capacitor,

diode means connected in parallel with said charging coil for reducing the maximum peak potential delivered to said ignition system circuit components with limited peak potential rating without detrimentally reducing said secondary potential delivered to said spark plug at low rotor speeds relative to the same ignition system without said diode means,

a solid state switch means connecting said capacitor to said primary winding, said solid state switch means being arranged to conduct current from said capacitor to said primary winding in response to a trigger signal, and

triggering circuit means coupling said primary coil and said solid state switch means such that said solid state switch means is rendered conductive in response to a trigger signal derived from said pulses generated by said primary winding upon energization thereof by said time-varying magnetic flux provided by said north and south magnetic poles, which trigger signal occurs after said capacitor has been energized.

4,056,089

THROTTLE VALVE LOCK FOR AUTOMOBILE

David P. Ratliff, 4578 Post, Troy, Mich. 48084

Filed Aug. 9, 1976, Ser. No. 712,924
Int. Cl.[2] F02B 77/00
U.S. Cl. 123—198 B **8 Claims**

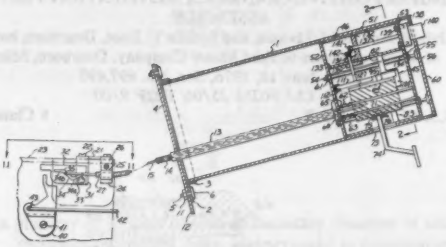
1. In combination, a throttle valve lock, a motor vehicle having an internal combustion engine, a carburetor mounted upon said engine, a passenger compartment, and a fire wall separating the passenger compartment from the engine, wherein the improvement comprises,

a lock member, having reciprocable travel between a throttle valve lock position to resist functioning of said throttle valve, and a throttle valve release position to afford such functioning,

means mounting said lock member relative to and exteriorly of said carburetor for such travel,

an actuator, mounted in the passenger compartment of such vehicle for operation by a driver,

drive means interconnecting said lock member and said actuator to transmit a reversible drive from said actuator to said lock member,



actuator support means supporting said actuator for reversible travel to operate said drive means,

at least one restraint element releasably engageable with said actuator to resist said reversible travel and immobilize said lock member in said lock position,

a restraint support to support said restraint element for said releasable engagement,

a first spring means urging said restraint element to engage said actuator,

a trigger to disengage said restraint element from said actuator, and

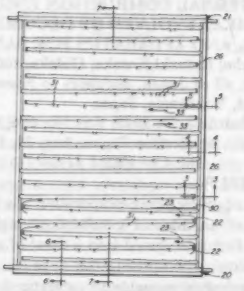
a second spring means urging said actuator to operate said drive means to establish said lock member in its throttle valve release position.

4,056,090

SOLAR HEAT COLLECTOR

Frederick C. Henriques, Simsbury; Joseph P. Pandolfo, Kensington, and Peter Lunde, West Simsbury, all of Conn., assignors to The Center for the Environment & Man, Hartford, Conn.

Filed Feb. 23, 1976, Ser. No. 660,617
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **12 Claims**



1. A solar heating panel comprising means in the form of a

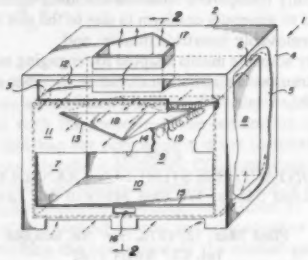
first sheet of substantially flat solid material to convert visible radiation into heat, a second sheet of substantially-flat solid material which is at least partially transparent to visible radiation and which is substantially opaque to infrared radiation through which to transfer visible radiation energy to said first sheet, means holding said sheets in confronting spaced-relation, means giving access to the space between said sheets for filling said space with a heat transfer liquid, means to guide said heat transfer liquid in a substantially laminar flow mode between said sheets, such that when said space is filled with a liquid having an index of refraction approximating the index of refraction of said second sheet substantially all visible radiation that is incident upon said panel will be transmitted therethrough to said first sheet for conversion into heat, and said liquid flowing in said laminar flow mode will thermally insulate said sheets one from the other.

4,056,091

VORTICAL FLOW AEROTHERMODYNAMIC FIREPLACE UNIT

Alexander John Moncrieff-Yeates, 8609 Hillside Place, Fairfax, Va. 22030

Filed Apr. 23, 1975, Ser. No. 570,798
Int. Cl.² F24B 7/00
U.S. Cl. 126—121 **21 Claims**



1. A heat exchange structure for use in a fireplace of the type including

an enclosure for a fire producing a hot thermally donative gas, said enclosure comprising side walls, a back wall, and a top wall,

a flue opening in said top wall for exhausting said donative gas,

an outer enclosure comprising walls spaced outwardly from said fire enclosure walls and defining therebetween passages for a thermally recipient air,

a front wall extending downwardly from a front portion of said top wall and including a fire enclosure opening therein,

means communicating air from said thermally recipient air passages through said front wall, said means comprising a duct extending between junctures with said back and front walls through a central portion of said fire enclosure,

said structure further characterized in that

said duct has a bottom surface comprising a flame plate for exposure to said donative gas in said enclosure, said flame plate being slanted upwardly toward one of said junctures to define throughout the extent of said one juncture a laterally extensive thermally donative air vorticity area throughout which the donative air is induced to whirl in a stable vortex proximate to and in heat exchange relationship to said flame plate and said wall structure.

4,056,092

FLAT PLATE SOLAR ENERGY COLLECTOR

Harold K. Meier, and John Michael Popovich, both of 9620 Royalton Drive, Beverly Hills, Calif. 90210

Filed July 26, 1974, Ser. No. 492,342
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **9 Claims**

1. A solar energy collector comprising:

a first member defining a first planar surface, said planar surface being spectrally transparent to solar radiation;

a second member defining a second planar surface parallel to and spaced from said first planar surface, said second planar surface being spectrally absorptive to solar radiation;

means adhering said first and second members together in a fluid-tight relationship defining a cavity between said first and second planar surfaces, said cavity having a cross-sectional dimension of about $\frac{1}{8}$ to $\frac{1}{4}$ inch; and

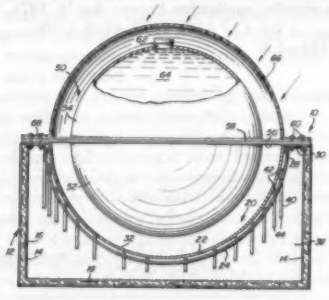
means for continuously circulating fluid through said cavity to define a radiation interference filter spectrally transparent to solar radiation and spectrally opaque to heat radiation.

4,056,093

SOLAR HEATER

Harold E. Barger, Paxton, Nebr. 69155

Filed Dec. 5, 1975, Ser. No. 638,096
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **4 Claims**

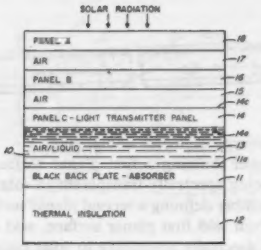


1. In combination, an upwardly opening generally hemispherical double wall boiler including closely radially spaced inner and outer hemispherical walls defining a closed chamber therebetween in which to receive a liquid to be heated, a hollow transparent spherical lens body of smaller outside diameter than the inside diameter of said boiler, supported concentrically from the upper peripheral portion of said boiler and closing the latter from above and filled with a transparent liquid, a downwardly opening hemispherical and transparent hollow cover secured over said transparent spherical lens in spaced relation thereto and with the centers of curvature of said spherical lens, inner and outer hemispherical walls and said cover substantially coinciding.

4,056,094
SOLAR HEAT COLLECTOR

Paul Rosenberg, Larchmont, N.Y., assignor to The Center for the Environment & Man, Hartford, Conn.

Filed Feb. 23, 1976, Ser. No. 660,437
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 13 Claims



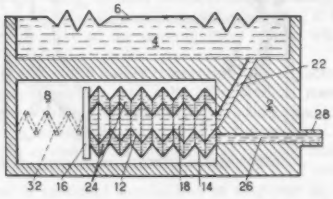
1. In a solar heating panel having an absorber panel for converting radiant energy into heat, a sheet of solid material substantially transparent to visible light for transferring such energy to said absorber panel, said absorber panel and said sheet of solid material defining a space for a heat transfer liquid, the improvement comprising:

internally-reflecting prism means on the surface of said sheet of solid material facing towards said space for heat transfer liquid, for substantially entirely reflecting visible light that is incident upon said panel when said heat transfer liquid is not present.

4,056,095
CONTROL DEVICE FOR MEDICAL AND SURGICAL USES

Pierre Theodore Joseph Rey, Thorigny; Jacqueline Agathe Marie Leandri. Paris, and Clement Claude Abbou, Fontenay S/Bois, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Apr. 1, 1976, Ser. No. 672,680
Claims priority, application France, Apr. 4, 1975, 75.10534
Int. Cl.[2] A61F 1/00; A61B 17/00
U.S. Cl. 128—1 R 22 Claims

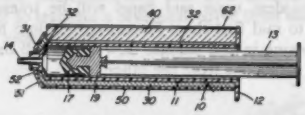


1. An externally actuated control device for operating a means for controlling a body duct or cavity in medical and surgical uses, implantable in sub-cutaneous position and actuatable by pressing on a sub-cutaneous membrane, said device comprising, in a casing, a first chamber, closed by said membrane which is positioned on one face of the casing and containing an incompressible fluid, and a second chamber, containing a gas and housing two coaxial bellows joined together at their free ends, one of the two bellows being an actuating bellows and communicating with said first chamber containing said incompressable fluid, and the second bellows with a flexible control duct going to said body duct or cavity to be controlled.

4,056,096
SHIELDED SYRINGE

Carl Collica, New Rochelle; Leonard Epifano, Rye, and Ralph Farella, Scarsdale, all of N.Y., assignors to Medi-Ray, Inc., Tuckahoe, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,531
Int. Cl.[2] A61B 6/00
U.S. Cl. 128—1.1 27 Claims



1. A shielded syringe, comprising:

a syringe having a barrel, a tip on the front of said barrel, and a plunger slideable in said barrel and extending from the rear of said barrel for manual actuation, said syringe having volumetric indicia disposed along its barrel;

a body of radiation-shielding material substantially covering the barrel of said syringe, said body having a slot therein which is in registration with at least some of said indicia;

a shell substantially covering said radiation-shielding body, said shell having a slot therein which is in registration with the slot in said radiation-shielding body;

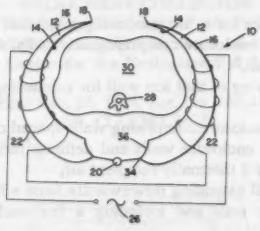
an optically transparent radiation-shielding member proportioned to generally conform in size to the slot in said body and removably insertible therein; and

manually actuable means adapted for engaging said shell and said transparent radiation-shielding member so as to removably retain said member in said body.

4,056,097
CONTACTLESS STIMULUS TRANSDUCER

Joachim Adolf Maass, 179 East Maxwell St., Lexington, Ky. 40508

Filed Mar. 15, 1976, Ser. No. 666,646
Int. Cl.[2] A61N 1/42
U.S. Cl. 128—1.5 8 Claims



1. Apparatus for stimulating a biological specimen, comprising at least two ferro-magnetic pole pieces, means for positioning said pole pieces in operative relation to said biological specimen, each of said pole pieces having an outer boundary surface of predetermined curvature and an inner curved surface intersecting the outer surface at opposite ends of the pole piece, said inner curved surfaces of the pole pieces confronting each other in at least partially encircling relation to the biological specimen to define a stimulus zone, a field winding mounted on each of said pole pieces intermediate the opposite ends thereof, a source of energizing current, and means connecting said source to the field windings for generating oppos-

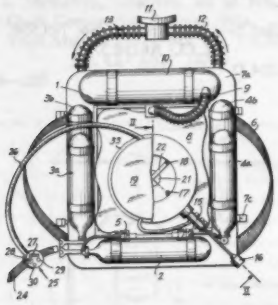
ing magnetic fields extending from the inner surfaces of the pole pieces into the stimulus zone.

4,056,098

RESPIRATORY APPARATUS FOR FREE UNDERWATER DIVER

Alain Marie Michel, Toulon, and Jean Edmond Parc, Toulon Naval, both of France, assignors to Etat Francais, Paris, France

Filed Jan. 7, 1976, Ser. No. 647,168
Claims priority, application France, Jan. 17, 1975, 75.01381
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142 R 8 Claims



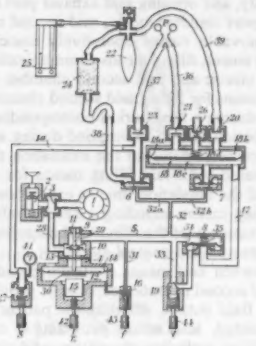
1. Respiratory apparatus for an underwater free diver comprising a sealed and deformable respiratory bag in pressure equilibrium with the exterior, diver connection means connected to said bag for permitting a diver to breath into and from said bag, absorbant means for CO_2 connected to said bag and to said diver connection means for passage of exhaled gas therethrough, an oxygen container connected to said bag, a container of compressed neutral gas connected to said bag, a valve controlling the connection of the neutral gas container with said bag, actuator means coupled to said valve and operated by said bag upon reduction of the volume thereof for opening said valve to admit neutral gas into said bag, sensor means for sensing the actual partial pressure of oxygen in said bag, said sensor means producing a voltage proportional to said actual partial pressure, an electrovalve controlling the connection of the oxygen container to said bag, electronic regulation means connected to said sensor means and to said electrovalve for automatically controlling said electrovalve to maintain the partial pressure of oxygen in said respiratory bag substantially equal to an assigned adjustable value, and a sealed casing containing said electrovalve and said electronic circuit means, said electronic regulation means comprising a subtractor for producing a signal equal to the difference between an adjustable reference voltage corresponding to the assigned value of the partial pressure of oxygen and the voltage furnished by the sensor means for automatically controlling the closure of the said electrovalve when the difference is less than a first threshold zero level, and a comparator means coupled to said subtractor for comparing the difference between the assigned value and the actual value of the partial pressure of oxygen to a second positive threshold value equal to a fraction of the reference voltage for effecting successive and discontinuous opening of the electrovalve when this difference is positive and less than the second threshold valve and for effecting continuous opening of the electrovalve when said difference is greater than the second threshold value.

4,056,099

VOLUMETRIC RESPIRATION EQUIPMENT

Robert Metivier, 49 rue du Docteur Blanche, 75016 Paris, France

Filed Jan. 20, 1976, Ser. No. 650,610
Claims priority, application France, Jan. 20, 1975, 75.01615
Int. Cl.[2] A61M 16/00
U.S. Cl. 128—145.6 4 Claims



1. Volumetric respirator for reanimating a patient, comprising, in combination:

a source of gases necessary for the patient's respiration;

control means for inhalating said gases into the patient's lungs and subsequently permitting the patient's exhalation with an adjustable inhalation time to exhalation time ratio, said control means including a housing having first and second chambers separated by diaphragm means, an inlet valve connected to said first chamber, a first conduit connecting said source with said inlet valve, inhalation valve means connected to said first chamber adapted to open for allowing the flow of said gases into the patient's lungs, and exhalation valve means adapted to open for subsequently allowing the flow of the gas breathed out by said patient, patient connection means, a first controlled membrane-type valve member closed during the inhalation time and open during the exhalation time, said first controlled membrane-type valve member having an inlet port communicating with said second chamber, a control port and a vent port;

an inhalation gas conduit connecting said inhalation valve means with said patient connection means;

an exhalation gas conduit connecting said patient connection means with said exhalation valve means, a second controlled membrane-type valve member having an inlet port communicating with said exhalation valve means, a control port and a vent port, a second conduit connecting said vent port of said second controlled membrane-type valve member with said source, said second conduit including means permitting the regeneration of the gas breathed out by the patient;

means for preserving the safety of operation of said respirator, consisting of a safety valve communicating with said exhalation gas conduit;

means controlling said control means for inhalating said gases from said source into the patient's lungs and subsequently causing the patient to exhale comprising:

a source of control fluid under pressure;

a main circuit for directing said control fluid under pressure towards said second chamber;

a circuit branched off said main control fluid circuit, which comprises in turn two branch lines leading to the control ports of said first and second membrane-type valve members, respectively;

means permitting the delivery of said control fluid to said

main circuit under a low pressure higher however than the pressure that the patient's lungs can withstand;

said means controlling said control means including a housing having first and second chambers, said first chamber including an inlet port communicating with said source of control fluid, an outlet port communicating with said second chamber and an exhaust port communicating with atmosphere, and valve means for closing said inlet port and opening said exhaust port simultaneously, and opening said exhaust port and closing said inlet port simultaneously, said second chamber including movable means operatively associated with said valve means, filling means communicating between said main circuit and said second chamber of said controlling means for filling said second chamber with control fluid during a time period corresponding to the inhalation period and to be emptied during another time period corresponding to the exhalation time, and means associated with said filling means for adjusting as required the inhalation time to exhalation time ratio;

said filling means including a needle valve for adjusting the frequency of the filling and emptying phases of said chamber in said control assembly;

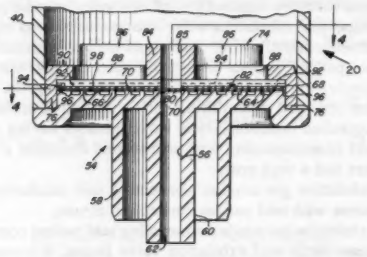
means between said means controlling said control means and said second chamber capable of providing a constant control fluid output, whereby the patient's compliance is compensated, said means providing a constant control fluid output including means for adjusting the value of said output.

4,056,100

VOLUME LIMITING CHAMBER

Douglas G. Noiles, New Canaan, Conn., assignor to United States Surgical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 504,733, Sept. 10, 1974, Pat. No. 3,967,620. This application July 1, 1976, Ser. No. 701,886
Int. Cl.² A61M 5/14
U.S. Cl. 128—214 C **23 Claims**



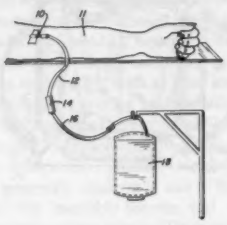
1. A volume limiting chamber for use in an intravenous set comprising a chamber having a top and a bottom and side walls connecting said top and bottom, an inlet passageway in said top for placing said chamber in fluid communication with a source of parenteral solution, an outlet passageway in said bottom for placing said chamber in fluid communication with an intravenous needle, indicia on said chamber for indicating the amount of parenteral solution in said chamber, a membrane valve positioned in said chamber and cooperating with said outlet fluid passageway so that all parenteral solution in said chamber flows through said membrane valve, said membrane valve comprising a material which when wet will pass parenteral fluid but will not pass air at normal intravenous administration pressures, and means for bypassing said membrane valve and allowing air to enter said chamber through said bottom from underneath said membrane valve when said membrane valve is wet, said bypass means comprising means for mounting said membrane valve in said bottom so that air can enter said volume limiting chamber around the periphery of said membrane valve, said mounting means comprising a surface against which said membrane valve is adapted to seat, said surface having a plurality of air passages formed therein in communication with said outlet passageway such that air forced through said outlet passageway and said air passages will act to unseat said membrane valve, said mounting means further comprising a bypass member spaced from said surface to define a membrane valve chamber therebetween, said membrane valve being mounted in said membrane valve chamber adjacent said surface, said bypass means further comprising a pressure pad mounted in said membrane valve chamber between said membrane valve and said bypass member whereby said membrane valve is resiliently urged into contact with said surface by said pressure pad.

4,056,101

MEANS FOR REDUCING TISSUE THROMBOPLASTIN IN COLLECTED BLOOD

Ulrich C. Geissler, Cary, and William J. Stith, Mundelein, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sept. 1, 1976, Ser. No. 719,556
Int. Cl.² A61M 5/00
U.S. Cl. 128—214 D **4 Claims**



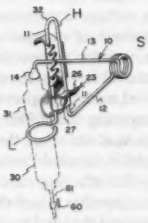
1. In a blood collection system including a phlebotomy needle, a main blood container and tubing for coupling the needle to the main container, the improvement comprising: a secondary blood container for collecting an initial volume of blood prior to collection of the blood in the main blood container, said secondary blood container comprising a blood receptacle concentrically positioned about said tubing, said tubing being open within said receptacle during flow of said initial volume whereby said initial volume will flow to said receptacle; and means for collecting said initial volume in said secondary container and thereafter channeling flow of the blood into said main blood container.

4,056,102

SPRING ACTUATED MEDICAL INJECTOR

Melvin Levinson, 7330 SW. 62nd Place, Miami, Fla. 33143, and Goodwin Salkoff, 450 Tivoli, Coral Gables, Fla. 33134

Filed Aug. 24, 1976, Ser. No. 717,355
Int. Cl.² A61M 5/00
U.S. Cl. 128—218 F **6 Claims**



1. A spring actuated medical injector comprising a substan-

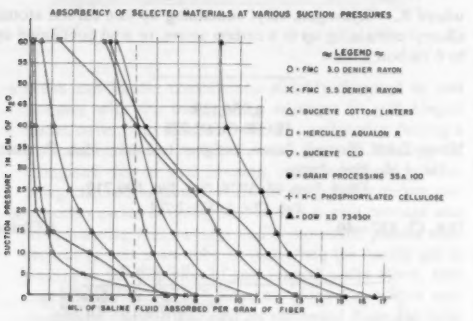
tially elongated wire body portion, syringe holding means mounted on one end of said elongated wire body portion and extending in one direction therefrom, spring holding means formed of wire mounted on said one end of said elongated body portion and extending in a substantially opposite direction, spring means mounted on said last named means, an actuating wire arm extending from said spring means in the direction of said elongated body portion, detent means mounted on said elongated wire body portion for engaging said actuating arm and preventing the swinging movement of said actuating arm and means releasing said actuating wire arm from said detent.

4,056,103

WRAPPER STRUCTURE FOR TAMPONS CONTAINING SUPERABSORBENT MATERIAL

Leonard M. Kaczmarzyk; James J. Hlaban, both of Neenah, and Patricia J. McKelvey, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 11, 1977, Ser. No. 776,635
Int. Cl.[2] A61F *13/20*
U.S. Cl. 128—285 **7 Claims**


ABSORBENCY OF SELECTED MATERIALS AT VARIOUS SUCTION PRESSURES
LEGEND
O • FMC 3.0 DENIER RAYON
X • FMC 5.5 DENIER RAYON
△ • BUCKEYE COTTON LINTERS
□ • HERCULES AQUALON R
▽ • BUCKEYE CLD
● • GRAIN PROCESSING 35A 100
+ • K-C PHOSPHORYLATED CELLULOSE
▲ • DOW XD 7345.01
SUCTION PRESSURE IN CM OF H2O
ML. OF SALINE FLUID ABSORBED PER GRAM OF FIBER

1. In a tampon comprised of an absorbent core containing superabsorbent materials and a fluid-permeable wrapper enclosing said core and in which said superabsorbent material has a suction pressure in the range of 25 cm. of H_2O or more when 5 ml. of physiological saline fluid are absorbed per gram of fiber, means for providing ease of withdrawal of the tampon comprising a body fluid lubricable wrapper material having a fluid retention capacity of 30% or more, said fluid retention capacity being the percent saline solution retained in the wrapper material at equilibrium conditions when said wrapper is in simulated contact with a superabsorbent material containing 100% saline solution by weight.

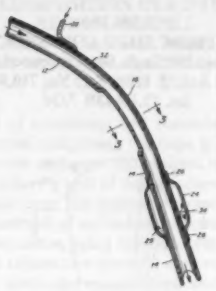
4,056,104

ENDOTRACHEAL TUBE

Burton Jaffe, 22 Burnham Road, West Newton, Mass. 02165

Filed Jan. 15, 1976, Ser. No. 649,329
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—351 **11 Claims**

1. An endotracheal tube comprising a pliable hollow plastic tube of a length many times its width having open distal and proximate ends defining a fluid passageway, a section of the tube spaced from either end having a triangular cross-section extending along at least a portion of the tube that would normally contact the larynx and conforming to the shape of the larynx when the tube is in position with the distal end of the tube in the trachea and the proximate end extending from the mouth, a cuff coaxial with and secured to the tube between the distal end and said section, and a cuff inflation lumen extending longitudinally from said cuff lengthwise of the wall of said section toward said proximate end, said section having a substantially uniform wall thickness along its length extending along the tube a distance less than the entire length of the tube



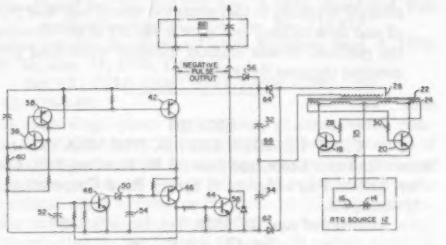
with the passageway through said section also having a triangular shape to optimize fluid passage through the tube.

4,056,105

PULSE GENERATOR

Richard J. Ravas, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 19, 1974, Ser. No. 525,123
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **5 Claims**



1. A radioisotope thermoelectric heart pacemaker comprising:

a radioisotope thermoelectric DC source;

a substantially constant input current inverter electrically connected to be driven by the source and having a square wave output;

a transformer having a primary winding connected to the square wave output and a secondary winding output;

a voltage multiplier rectifier having an input from the transformer secondary winding and an output;

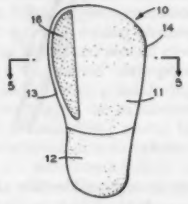
a capacitive reactance, having an output which is adapted to be connected to the heart, comprising a plurality of series coupled capacitors respectively connected in parallel across the secondary winding through the rectifier in a manner that will provide a voltage across the reactance equal to the secondary winding output multiplied by the number of capacitors;

means for monitoring the voltage level across the capacitive reactance and comparing the monitored voltage with a preselected fixed reference level; and

means connected between the capacitive reactance and the output to the heart for cyclically discharging the capacitive reactance through the heart at a substantially constant rate, said discharge means being responsive to said monitoring means to disconnect the capacitive reactance from the heart during the discharge portion of each cycle prior to substantial discharge of the reactance when the voltage

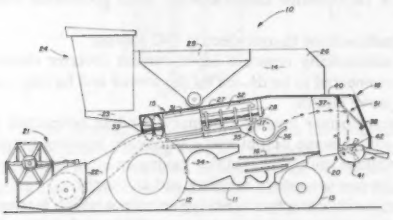
across the reactance drops below the preselected reference level.

4,056,106
ORTHOPEDIC SHOE CONSTRUCTION
Joseph E. Salvatore, 200 Engle St., Englewood, N.J. 07631
Filed Aug. 2, 1976, Ser. No. 710,912
Int. Cl.[2] A43B *7/24*
U.S. Cl. 128—583 **12 Claims**



1. A shoe having an upper and a sole and heel portion,
an orthopedic friction corrective member attached to said sole portion,
said sole portion having generally a flat outer surface,
said friction member positioned at the great toe side of said sole portion to retard the movement of said shoe when said shoe engages the ground under the weight of the wearer of said shoe creating a friction surface at the point of application of said friction member whereby internal rotation is caused at said great toe side of said sole portion of said shoe turning said shoe inwardly in the direction of the position of said friction member when said friction member engages the ground.

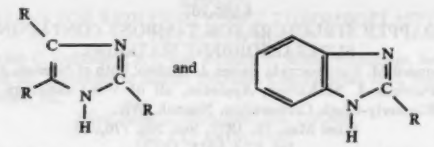
4,056,107
CROP RESIDUE DEFLECTOR MEANS
Robert R. Todd, Leola, and Edward W. Rowland-Hill, Lancaster, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Apr. 26, 1976, Ser. No. 679,956
Int. Cl.[2] A01F *7/06*
U.S. Cl. 130—27 R **8 Claims**



1. In a combine having a hollow residue receiving discharge hood provided with a downwardly facing residue outlet for receiving residue material emanating from said combine and a residue treating means, such as a straw chopper or the like, mounted in the vicinity of said outlet for treating said residue material and discharging the same onto the ground, the improvement comprising:
a deflector mounted within said hood above said treating means and adapted to be disposed between a first position wherein said emanating residue material is deflected into said treating means and a second position wherein said emanating residue material is deflected through said residue outlet to thereby bypass said treating means; and
means for mounting said deflector for movement between said first and second positions.

4,056,108
TOBACCO PRODUCT
Joseph N. Schumacher; Freddie W. Best, and Charles R. Green, all of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Continuation-in-part of Ser. No. 578,806, May 19, 1975. This application Apr. 21, 1976, Ser. No. 679,009
Int. Cl.[2] A24B *3/12*
U.S. Cl. 131—17 R **7 Claims**

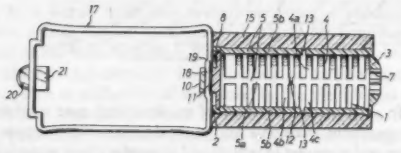
1. A tobacco product or foodstuff having added thereto a small amount sufficient to alter the flavor or aroma of the tobacco product or foodstuff of a compound selected from the group of compounds having the following formulae:



I II

where R = hydrogen, alkyl containing up to 6 carbon atoms, alkenyl containing up to 6 carbon atoms, or acyl containing up to 6 carbon atoms.

4,056,109
HAIR-CURLER
Hisao Takai, Katano, Japan, assignor to Lucky Hair Products Co., Ltd., Yao, Japan
Filed June 16, 1976, Ser. No. 696,710
Int. Cl.[2] A45D *2/00*
U.S. Cl. 132—40 **8 Claims**



1. A hair-curler comprising a cage-like tubular core, a hollow cylindrical cover of cellular synthetic resin covering the tubular core, and a rectangular holding frame pivotally connected to one end of the tubular core and provided with an engaging projection detachably engageable in the other end of the tubular core; the tubular core: (1) being formed at its one end with at least two slots intersecting each other at the center of the end for engaging the engaging projection of the holding frame, the slots being formed in an outwardly bulged center portion of the end which provides a guide surface for the engaging projection of the holding frame; (2) having at its longitudinal midportion a flexible portion bendable with the cover when the tubular core is subjected to an external force at its opposite ends; and (3) having a frame support fittingly retained on the inner peripheral wall of the other end of the tubular core against displacement longitudinally of the tubular core but rotatable circumferentially of the tubular core; and the rectangular holding frame being integral in its entirety and surrounding the cover.

4,056,110
COMBINATION BRUSH AND PASTE DISPENSER
Emanuel Landsman, 245 N. Broadway, Yonkers, N.Y. 10701
Filed Oct. 19, 1976, Ser. No. 733,824
Int. Cl.[2] A45D *44/18*
U.S. Cl. 132—84 R **12 Claims**

1. A combination of brush and paste dispenser for dispensing

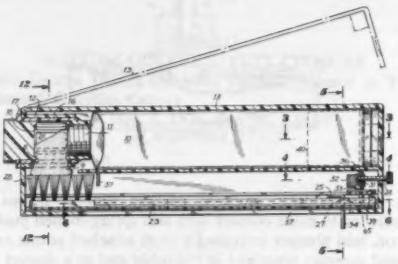
a measured amount of paste from a tube onto a brush comprising:

a hollow elongated housing having a hinged outlet cover mounted on one end and a top cover providing access to the top of said housing;

a first compartment in said housing for receiving and securing the tube of paste;

paste applying means for coupling to the outlet of the paste tube and disposed above said hinged outlet cover;

a carriage slidably disposed in said housing and including a compression paddle for engaging the side walls of the paste tube;



a brush and handle combination slidably disposed in said housing with the brush being adjacent to said hinged outlet cover, said brush and handle combination having a pin connected to the handle and disposed through an elongated slot in said housing, and said brush portion being disposed adjacent to said brush applying means; and

connection means coupling said handle to said carriage and for advancing said carriage and compression paddle with respect to said paste tube so that when the handle pin is pushed in the direction of said hinged outlet cover, said compression paddle will advance along the side of said paste tube causing paste to be dispensed from the tube outlet through said paste applying means onto said brush as the brush is advanced out of said hinged outlet cover.

4,056,111

COSMETIC APPLICATOR

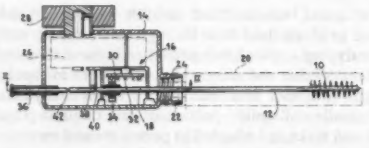
Jean Mantelet, 46-48, Avenue Montaigne, 75008 Paris, France

Filed June 2, 1976, Ser. No. 692,185

Claims priority, application France, Mar. 30, 1976, 76.09133

Int. Cl.[2] A45D *40/26, 24/00*

U.S. Cl. 132—88.7 **9 Claims**



1. An applicator for a cosmetic product, particularly for eyelashes, comprising a painting tool, such as a cylindrical or conical brush having radially extending bristles, which tool is adapted to receive the said product and is carried by a rod, the axis of which is an extension of the axis of the tool, said rod being mounted for rotation in a casing adapted to be held by hand, and a drive device contained in said casing and comprising a rotary output shaft coupled to the rod, wherein the drive device comprises a spiral spring motor adapted to be wound by means of a button mounted for movement on and relative to the casing, and a speed step-up mechanism disposed between the motor and the output shaft.

4,056,112

CONTAINMENT AND REMOVAL OF RADIOACTIVE SPILLS BY DEPOSITING A CROSSLINKED ION EXCHANGE COMPOSITION IN A DRY FORM OVER REGION OF SPILL

Calvin Calmon, Arneys Mount Road, Birmingham, N.J. 08011

Filed May 2, 1974, Ser. No. 466,232

Int. Cl.[2] B08B *7/00*

U.S. Cl. 134—6 **18 Claims**

1. A method of containing and removing spills of liquid radioactive material comprising the steps of

depositing an ion exchange composition in a dry form over the region where a spill of liquid radioactive material has occurred and over the regions surrounding said spill region, the amount of cross-linking agent in said ion exchange composition being selected so that the radioactive ions of said radioactive material are exchanged with ions of said ion exchange composition, said radioactive ions being held in said ion exchange composition, and said liquid is simultaneously absorbed by said ion exchange composition and substantially confined to said spill region;

removing said ion exchange composition from said spill region and from said surrounding regions after said ion exchange and said absorption operations have occurred.

4,056,113

LIQUID DETERGENT COMPOSITIONS FOR REMOVAL OF COOKED-ON FOOD SOILS

Eric M. Johnson, Blyth; Graeme D. Murray, and Frederick E. Hardy, both of Newcastle-on-Tyne, all of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 503,123, Sept. 4, 1974, abandoned. This application Aug. 31, 1976, Ser. No. 719,312

Claims priority, application United Kingdom, Sept. 4, 1973, 41496/73; Mar. 15, 1974, 11628/74

Int. Cl.[2] C11D *3/065, 3/43, 17/08;* C23G *5/00*

U.S. Cl. 134—40 **16 Claims**

1. A clear single-phase liquid detergent composition comprising from 26 to about 50% by weight of the composition of anionic detergent selected from the group consisting of linear alkyl benzene sulfonates having from 8–18 carbon atoms in the alkyl radical, alkyl sulfates having from 10–20 carbon atoms, paraffin sulfonates having from 10–20 carbon atoms, alkyl polyglycol ether sulfates having from 10–20 carbon atoms in the alkyl group and from 1–6 ethoxy groups in the molecule, and mixtures thereof; from about 0.5 to about 15% by weight of the composition of the anion of a condensed phosphoric acid; from 0 to 10% by weight of the composition of mono- or di-lower alkyl benzene sulfonate having a total of 1 to 3 carbon atoms in the alkyl group; wherein the cations of the detergent, the phosphoric acid salts and the mono- or di-lower alkyl benzene sulfonate are solely monoethanolammonium and wherein the composition is solubilized in water with a lower alcohol having from 1 to 3 carbon atoms.

8. A process for the removal of cooked-on food soils from cookware and tableware, comprising the steps of:

a. soaking said cookware and tableware in an aqueous solution comprising from about 0.5 to about 2%, by weight, of a clear single-phase liquid detergent composition comprising from 26 to about 50% by weight of the composition of anionic detergent selected from the group consisting of linear alkyl benzene sulfonates having from 8–18 carbon atoms in the alkyl radical, alkyl sulfates having from 10–20 carbon atoms, paraffin sulfonates having from 10–20 carbon atoms, alkyl polyglycol ether sulfates having from 10–20 carbon atoms in the alkyl group and from 1–6 ethoxy groups in the molecule, and mixtures thereof; from about 0.5 to about 15% by weight of the composition of the anion of a condensed phosphoric acid; from 0 to 10% by weight of the composition of mono- or di-lower alkyl benzene sulfonate having a total of 1 to 3 carbon atoms in the alkyl group; wherein the cations of the detergent, the phosphoric acid salts and the mono- or di-lower alkylben-

zene sulfonate are mixtures of monoethanolammonium and at least one cation selected from the group consisting of ammonium, sodium, potassium, calcium, and magnesium, wherein said monoethanolammonium cation is present in an amount equal to at least 20 mole percent of the cation mixture; and wherein the composition is solubilized in water with from about 3 to about 15% of a lower alcohol having from 1 to 3 carbon atoms; and

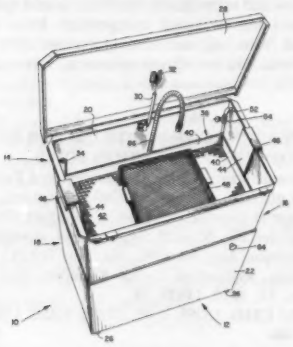
b. washing said cookware and tableware in an aqueous solution comprising from about 0.05 to about 2%, by weight, of said detergent composition.

4,056,114

PARTS WASHER AND FILTER ASSEMBLY THEREFOR

Arthur A. Boutillette, 22 Old Dudley Road, Oxford, Mass. 01540

Filed June 3, 1975, Ser. No. 583,452
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—104 **23 Claims**



1. A cleaning fluid recirculating and filtering parts washer comprising: a generally rectangular cabinet structure including front, rear and side walls and a bottom; a sink for washing parts forming an upper portion of said cabinet, a controllable drain in said sink located adjacent one of said cabinet walls; a tank forming a lower portion of said cabinet and communicating with said drain; pump means for circulating cleaning fluid to said sink located in said tank adjacent another of said cabinet walls opposite the disposition of said sink drain and said one cabinet wall; and cleaning fluid filtration means surrounding said pump means and extending from said cabinet bottom to a level above a predetermined level of cleaning fluid therein; whereby cleaning fluid contaminated by a parts washing operation in said sink and entering said tank from said sink drain must travel substantially across said tank, from said drain to said pump means, thus allowing a substantial portion of waste particles and other contaminants to settle by gravity to the bottom of said tank prior to passing through said filtration means and pump for circulation back to said sink.

4,056,115

ADAPTER FOR MANIPULATING A SPRING LOADED PUSHBUTTON

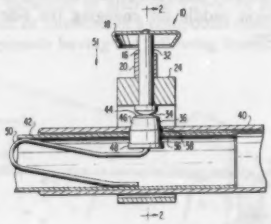
Morton I. Thomas, 101 Gedney St., Nyack, N.Y. 10960

Filed May 6, 1976, Ser. No. 683,978
Int. Cl.[2] A45B *1/00*
U.S. Cl. 135—67 **8 Claims**

1. An adapter apparatus for manipulating a spring-loaded pushbutton located between two overlapping members, said overlapping members comprising an inner tubular member which telescopes into an outer tubular member, both of said tubular members including a hole therethrough through which said spring-loaded pushbutton is biased when said holes are aligned one opposite the other, said apparatus comprising:

a support means adapted for rigid connection to one of said overlapping members, said support means comprising a collar which is adapted to fit around said outer tubular member, said collar including an interior opening and an exterior side and a hole communicating said interior opening with said exterior side;

a substantially flat pressure plate;



a plunger slidably engaged by said support means and adapted to make contact with said spring-loaded pushbutton, said plunger including a shaft attached at one end to said pressure plate and at the other end to a domed head which is adapted to make contact with said pushbutton, said shaft of said plunger passing through said collar hole with said pressure plate being located on the exterior side of said collar and said domed head being located within said interior opening; and,

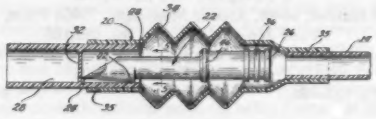
a sleeve surrounding said plunger shaft and located between said pressure plate and said collar.

4,056,116

VALVE FOR INTERCONNECTING STERILE CONTAINERS AND THE LIKE

Garry L. Carter, Palatine, and Daniel B. Granzow, Arlington Heights, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sept. 8, 1976, Ser. No. 721,622
Int. Cl.[2] A61M *5/14*
U.S. Cl. 137—68 R **7 Claims**



1. In a sealed, tubular fluid conduit having a diaphragm positioned to block fluid flow through said conduit, said fluid conduit carrying a spike having front and rear ends positioned in said fluid conduit and adapted for movement to rupture said diaphragm with said front end, and a transversely-enlarged, flexible, axially-collapsible portion of said conduit positioned adjacent said spike and adapted to permit manual movement of said spike from outside of said conduit to rupture said diaphragm, the improvement comprising, in combination:

a longitudinal groove defined in said spike extending from said front end and terminating at a point between said front and rear ends, said spike also defining an annular, enlarged sealing portion of a transverse dimension which is proportioned to sealingly occlude a portion of said conduit adjacent to said transversely-enlarged, collapsible portion, said sealing portion being positioned between said terminating point of the groove and the rear end of the spike, said spike being positioned so that said enlarged sealing portion normally resides within said transversely-enlarged collapsible portion, said spike and conduit being

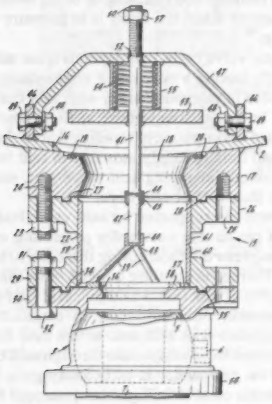
dimensioned such that upon rupture of the diaphragm a flow path is defined through said groove and about said enlarged seal portion, whereby, for resealing said conduit after rupture of the diaphragm, the spike may be moved to bring said enlarged sealing portion into flow-blocking relation with said conduit immediately adjacent to said transversely-enlarged portion.

4,056,117

BOTTOM OUTLET SAFETY CLOSURE

Ronald George Deeks, Oakville, Canada, assignor to Procor Limited, Oakville, Canada

Filed Nov. 4, 1976, Ser. No. 738,937
Int. Cl.[2] F16K *17/40*
U.S. Cl. 137—68 R 10 Claims



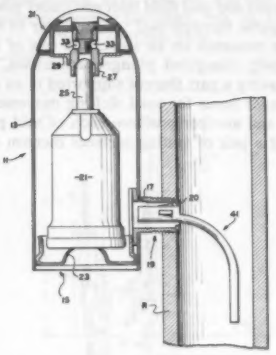
1. A safety device for preventing escape of a fluid from the outlet opening of a tank when a valve that normally regulates flow through said outlet opening is damaged, comprising: a saddle having a hole therethrough and being attached to the outside of said tank and surrounding said outlet opening, a gasketed surface on said saddle around said hole, a hollow tube connected to said saddle and aligned with said hole, said valve being connected to and aligned with said tube, a shoulder on said valve around the inlet port of said valve facing the inside of said tube, a perforated disc resting on and being restrained from movement by said shoulder and surrounding said inlet port, a rod connected to said disc and passing through said tube and said saddle and said outlet opening into said tank, a bracket attached to the inside of said tank and spanning said outlet opening, a safety closure plate for seating against said gasket attached to said rod between said bracket and said outlet opening, spring means between said plate and bracket for forcing said plate against said gasket, said rod normally maintaining said closure plate in an open position against the bias of said spring means, a fracture groove around said tube between said saddle and said shoulder for causing a portion of said tube connected to said valve and said valve to break away from said tank on impact capable of causing leakage from said tank by damaging said valve, the breaking away of said valve removing the restraining effect of said shoulder and enabling said perforated disc and rod to move under the force of said spring means so as to cause said closure plate to seat against said gasket and prevent escape of fluid from said tank.

4,056,118

SYPHON TUBE AND VENT VALVE ASSEMBLY

Jay H. Bradford, Elgin, and Norman T. Terp, St. Charles, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sept. 17, 1975, Ser. No. 613,385
Int. Cl.[2] F16T *1/20*
U.S. Cl. 137—201 6 Claims



1. A radiator vent valve including a valve body and a threaded valve nipple adapted to engage a wall of a radiator and define a passage communicating between the interior of the radiator and the interior of said valve body, said vent valve including a syphon tube for draining condensate from the interior of said valve body into the interior of said radiator, said syphon tube comprising:

a. a tubular first portion adapted to be inserted into said passage defined by said valve nipple, said tubular first portion including resilient tab means formed of resiliently deformable material disposed in circumferentially spaced arrangement about the outer surface of said tubular first portion, said resilient tab means deforming to permit insertion of said tubular first portion into said passage and after said insertion, resiliently recovering from said deformation and engaging an inner surface of said valve nipple for resisting removal therefrom;

b. a generally trough-shaped second portion providing a continuous flow path with said tubular first portion and oriented generally coplanar therewith; and

c. a generally trough-shaped third portion providing a continuous flow path with said trough-shaped second portion, said third portion being oriented relative to said second portion to direct the flow of condensate downwardly when said tubular first portion is oriented generally horizontally.

4,056,119

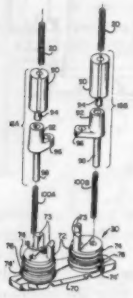
SOLENOID VALVE

Walter E. Allen, Prospect, Conn., assignor to Peter Paul Electronics Co., Inc., New Britain, Conn.

Division of Ser. No. 498,089, Aug. 16, 1974, Pat. No. 3,965,923.
This application June 22, 1976, Ser. No. 698,746
Int. Cl.[2] F16K *31/02*
U.S. Cl. 137—315 11 Claims

1. A solenoid actuated control valve comprising a body assembly including a body member having fluid inlet and outlet ports opening exteriorly thereof for connection with fluid conduits and first and second chamber bores opening outwardly therethrough and respectively partially defining first and second valve chambers, said body assembly including a pair of axially elongated tubular plunger sleeves attached to said body member and defining first and second plunger bores respectively communicating with said first and second chambers and having mounting means for securing said body member in fixed position on an associated supporting means, said

body assembly including a cartridge member having connected first and second portions respectively received in said first and second chamber bores providing closures therefore and respectively further defining said first and second valve chambers and means for releasably retaining said cartridge member in assembly with said body member, a pair of valve seats in each of said chambers, means defining fluid passageways through said body assembly and communicating with said valve seats and said fluid inlet and outlet ports for defining fluid flow paths through said valve, a pair of solenoids each respectively mounted on an associated one of said sleeves, a pair of axially elongated plunger assemblies, each plunger assembly having a part thereof supported in an associated one of said plunger bores for axial shifting movement therein between one and another position, each of said plunger assemblies having a pair of seating surfaces thereon disposed in an



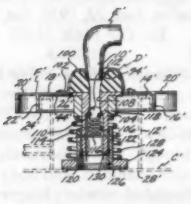
associated one of said valve chambers, one of said seating surfaces engaging and closing one of said valve seats in said associated chamber when said plunger assembly is in one of its positions, the other of said seating surfaces engaging and closing the other of said valve seats when said plunger assembly is in the other of its positions, and means for biasing each of said plunger assemblies to and normally retaining it in one of its positions and yieldably resisting shifting thereof on energization of an associated one of said solenoids to the other of its positions to open said one of said valve seats and close said other of said valve seats, said cartridge member, said plunger assemblies and said biasing means comprising a cartridge subassembly which may be removed as a unit from said body assembly when said body assembly is mounted in fixed position on the supporting means by said mounting means and said inlet and outlet ports are connected to associated fluid conduit means.

4,056,120

VALVED AUTOMOTIVE RADIATOR CAP

George C. MacNeilage, 16302 Sierra Trail Court, Hacienda Heights, Calif. 91745

Filed May 27, 1976, Ser. No. 690,635
Int. Cl.[2] F16K *45/00, 15/00*
U.S. Cl. 137—493.9 1 Claim



1. A valved radiator cap assembly capable of being removably mounted on a filling tube of an automotive radiator of the type that includes a cylindrical shell having first and second ends, a flat circular flange extending outwardly from said first end, a pair of oppositely disposed first tabs depending from said flange, and a ring-shaped lip projecting inwardly from said second end of said shell, said shell having an opening therein between said first and second ends that is in communication with an overflow line, said assembly permitting water under pressure to be discharged into said radiator from a nozzle having a tapered end without removing said assembly from said filling tube, said assembly permitting water and steam to escape from said radiator through said opening to said overflow line when the pressure in said radiator rises above a predetermined level, said assembly permitting a negative pressure in said radiator to be partially relieved by flow of air thereinto from the ambient atmosphere as said radiator cools, said assembly including:

a. a cover removably mounted on said first end of said shell, said cover including a pair of oppositely disposed second tabs that engage said first pair of tabs to maintain said cover on said filling tube, said cover having a central opening therein;

b. an exteriorly disposed tubular resilient body that projects outwardly from said cover, is permanently secured to said cover, and is in communication with said central opening, with said resilient body capable of being sealingly engaged by said nozzle when the latter is in pressure contact with said body;

c. an elongate valve body that depends from said cover, said valve body having a bore and a counterbore therein, said counterbore in communication with said central opening, and said bore and counterbore at their junction defining and inward and upwardly tapering valve seat;

d. a rigid ball longitudinally movable in said bore and capable of sealingly engaging said valve seat, said ball of less diameter than that of said bore;

e. a transverse pin supported by said valve body below said ball, said pin having outwardly projecting end portions;

f. a first compressed helical spring disposed in said bore with one end thereof in abutting contact with said ball and the other end in contact with said pin, said first spring having a compression ratio sufficient to maintain said ball in sealing contact with said seat with a first force to permit water to flow from said nozzle through said bore when the pressure on said water is sufficiently great as to exert a second force on said ball greater than said first force;

g. a tubular member slidably and sealingly movable in a longitudinal direction on the exterior surface of said valve body, said member having a pair of oppositely disposed, elongate, longitudinal slots therein that are slidably engaged by said end portions to limit the range of movement of said tubular member relative to said valve body and to prevent inadvertent separation of said tubular member and valve body;

h. an outwardly projecting ring-shaped valve member secured to the end portion of said tubular member most remote from said first spring, said valve member having first and second oppositely disposed sides;

i. abutment defining means on said tubular member adjacent said cover;

j. a resilient sheet of material bonded to said first side of said valve member;

k. a second compressed helical spring that encircles said tubular member, said second spring having one end in contact with said abutment means and the other end in contact with said second side of said valve member, said second spring at all times tending to maintain said resilient sheet in pressure sealing contact with said ring-shaped lip with a third force, with a portion of said resilient sheet at all times in communication with the interior of said radiator, and when pressure of fluid in said radiator exerts a fourth force on said resilient sheet greater than said third force said tubular member, valve member and resilient sheet will move towards said cover to allow fluid to flow to said overflow line from said radiator until said third force is greater than said fourth force, said ball when there

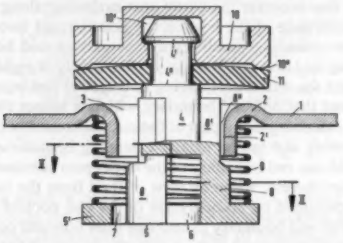
is a negative pressure in said radiator of sufficient magnitude will move out of sealing contact with said valve seat against the first force of said first spring to allow air from the ambient atmosphere to flow into said radiator until said first force returns said ball to sealing engagement with said valve seat.

4,056,121

PRESSURE COMPENSATION VALVE ARRANGEMENT

Theodor Gerdes, 24, Lortzingweg, D 4018 Langenfeld, Rheinland, Germany, assignor to Blau KG Fabrik fur Kraftfahrzeugteile, Langenfeld, Germany

Filed June 1, 1976, Ser. No. 691,407
Claims priority, application Germany, June 10, 1975, 2525708
Int. Cl.[2] F16K *15/06*
U.S. Cl. 137—541 7 Claims



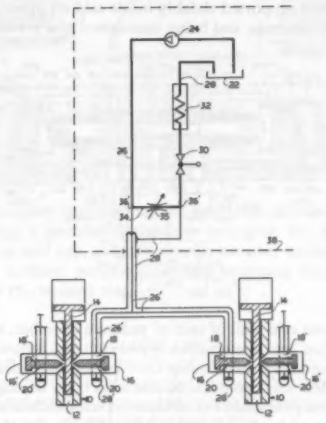
1. In an arrangement for preventing fluid pressure from exceeding a predetermined value, a combination comprising a valve support having a raised annular valve seat which bounds a passageway for a pressurized fluid, said passageway extending between a fluid inlet at one side of said support and a fluid outlet at the other side of said support; a valve stem extending through and mounted for movement along said passageway, said stem having an exposed end at said one side of said support which faces and is acted upon by the pressurized fluid to thereby move said stem when the pressure of the fluid exceeds the predetermined value, and another opposite end at said other side of said support; a valve head mounted at said other end for movement with said stem, said head having a raised annular collar which extends circumferentially about said annular seat; a dish-shaped resilient element mounted on said stem for movement therewith, said resilient element engaging said annular collar and overlying said annular seat; a flange at said exposed end and overlying said one side of said support; biasing means surrounding said stem intermediate said flange and said one side of said support, said biasing means being operative for moving said stem and urging said collar and said resilient element into sealing engagement with said seat when the pressurized fluid acting on said exposed end is below the predetermined value; and means for establishing fluid communication between said exposed end and said passageway, including a plurality of ribs equidistantly spaced circumferentially of said stem, each rib having an upper rib portion extending lengthwise of said stem and a lower rib portion extending from said upper rib portion to said flange, each lower rib portion having a larger cross-sectional dimension than said upper rib portion for strengthening said flange, each two circumferentially adjacent ribs bounding a channel and all of said lower rib portions bounding a cavity at said exposed end, each channel communicating with said cavity and with said passageway when the pressure of the fluid in said cavity exceeds the predetermined value and moves each channel into communication with said passageway.

4,056,122

FLUID COMPONENT RECYCLING SYSTEM IN A PLURAL COMPONENT PLASTICS MOLDING MACHINE

Alfred Schlieckmann, Lindau, and Kurt Moser, Kirchheim, both of Germany, assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 9, 1976, Ser. No. 656,164
Claims priority, application Germany, Feb. 21, 1975, 2507580
Int. Cl.[2] B29B *5/04*
U.S. Cl. 137—563 6 Claims



1. In a system for supplying one of a plurality of fluids under pressure to a mixing head having a mixing chamber into which the fluids are injected to produce mixing thereof, a valve chamber associated with said head and an inlet valve in said valve chamber controlling admission of said one fluid from said valve chamber to said mixing chamber, a fluid reservoir for said one fluid, a supply line connecting said valve chamber to said reservoir, and pump means in said supply lines to deliver said fluid under pressure from said reservoir to said valve chamber, a return line connecting said valve chamber to said reservoir, and a stop cock in said return line, whereby fluid can be circulated by said pump from said reservoir through said supply line to said valve chamber and back through said return line to said reservoir when said stop cock is open; the improvement which comprises

a by-pass line between said supply line and said return line in shunt connection with said inlet valve chamber, said by-pass line being located upstream of said stop cock;

said by-pass line affording resistance to flow therethrough and thereby causing division of fluid flow between said by-pass line and said valve chamber.

4,056,123

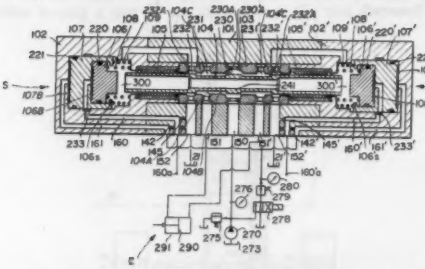
HYDRAULIC OSCILLATOR

Tsuneo Kimura, Kusatsu, and Shiro Takeshika, Ikeda, both of Japan, assignors to Nihon Spindle Seizo Kabushiki Kaisha, Japan

Filed Sept. 25, 1974, Ser. No. 509,184
Claims priority, application Japan, Sept. 26, 1973, 48-108194; Nov. 12, 1973, 48-127082
Int. Cl.[2] F01L *31/00, 25/04*
U.S. Cl. 137—624.14 5 Claims

1. A hydraulic oscillator, said oscillator being self-excited, comprising a main body, said main body being equipped with an oil inflow port having inwardly divergent walls, a first pair of flow ports for alternately receiving and transmitting pressurized oil therethrough, an oil pressure chamber having a wall in said main body, a vibratory member in said oil pressure chamber, said vibratory member being positioned for bringing

them into self-excited oscillation by flow of pressurized oil through said oil inflow port and said flow ports, and a pair of resiliently disposed stopper means positioned for regulating the excursion of said vibrating member in each of opposed directions by impact of said vibrating member against said stopper means, both of said stopper means including first and second stoppers adapted to be positionally displaced with respect to each other, and first and second resilient biasing means for respectively resiliently positioning said first and second stopper with respect to said oil pressure chamber, said oil pressure chamber having two opposed ends and having axially aligned bearings proximate both of said ends, said vibratory member being a spool supported slidably inside said oil pressure chamber by said bearings, and being maintained at a predetermined



spacing from said wall of said oil pressure chamber, said spool having a first land at a position opposed to said inflow port and being in minus-lap relationship thereto, said first land dividing said chamber into two pockets, said main body having a pair of second ports positioned for connection with each of said pockets, said spool having a pair of second lands for closing and opening each of said pair of second ports alternately during oscillation of said spool, the relation of said first land to said inflow port being such that pressurized oil flows alternately into each of said pockets during oscillation of said vibratory member and out through the corresponding port of said first pair of ports, while oil in the pocket other than that containing pressurized oil can flow out of same through the other corresponding port of said pair of second ports said first land and said pair of second lands being of the same diameter.

4,056,124

FLUID MIXING VALVE FOR SUPPLYING CONTROLLABLE PROPORTIONS OF TWO INLET FLUIDS FROM A SINGLE OUTLET

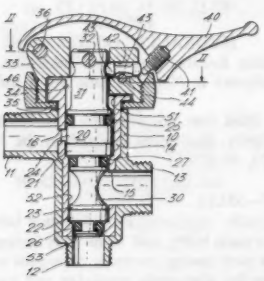
Derek John Goldsmith, 6, Downe Avenue, Cudham, Sevenoaks, Kent, England

Filed Feb. 20, 1976, Ser. No. 659,917

Claims priority, application United Kingdom, Feb. 22, 1975, 7567/75; Mar. 14, 1975, 10697/75

Int. Cl.[2] F16K *11/07*

U.S. Cl. 137—625.17 **11 Claims**



1. A fluid mixing valve comprising a housing having a bore therein and provided with two spaced fluid inlet ports communicating with the bore at spaced locations therealong for the admission of fluid to the bore and an outlet port for discharging fluid from the bore, said outlet port communicating with the bore at a location intermediate the said spaced locations, and a valve member within the bore in the housing axially movable in the bore for controlling fluid flow from the respective inlet ports through the bore to the outlet port and rotatable in the bore for controlling the relative volume rates of flow through the two inlet ports, said valve member being provided with two arcuate control surfaces eccentric in relation to the axis of rotation of the valve member and each control surface cooperable with separate ones of the ports for inversely controlling, responsive to rotation of the valve member, the relative rates of fluid flow through the individual inlet ports, said control surfaces comprising cut-away portions of the valve member axially spaced along the length of the valve member, one of the control surfaces co-operating with one of the inlet ports and the other co-operating with the outlet port for controlling relative fluid flow through the two inlet ports, that one inlet port which is co-operable with one of said control surfaces having two spaced end boundaries with at least that one end boundary that is nearer the outlet port extending along part of the circumference of the bore in the housing and two lateral boundaries extending parallel with the axis of said bore and intersecting said one end boundary substantially at right angles thereto, and the outlet port having two spaced end boundaries with at least that one end boundary which is nearer the other inlet port extending along part of the circumference of the bore in the housing and lateral axially extending boundaries intersecting said one end boundary of the outlet port substantially at right angles thereto, whereby flow of fluid from the two inlet ports is controlled by co-operation of the one control surface with the one end boundary of said one inlet port and co-operation of the other control surface with the one end boundary of said outlet port.

4,056,125

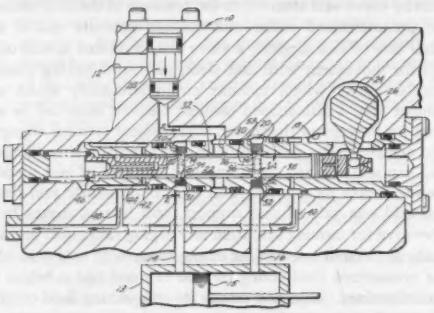
EXTENDED LIFE STRUCTURE FOR SPOOL VALVE

Vernon L. McNabb, Van Nuys, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Oct. 2, 1975, Ser. No. 618,976

Int. Cl.[2] F16K *47/08;* F16B *13/04*

U.S. Cl. 137—625.3 **3 Claims**



1. In a flow control valve wherein a spool valve member having a plurality of lands is moveable within a sleeve to cause said lands to open and close radially directed fluid passageways through the sidewalls of said sleeve,

at least some of said passageways including cylindrical chambers and fine radial passageways communicating said chambers with the inside of said sleeve, and

a stack of laminar disk members positioned in said cylindrical chambers, said stack including disks of a first group including a central opening of large area and disks of a second group including an orifice of limited area each of which introduces a substantial pressure drop thereacross,

said stack comprising alternate disks of said first group and said second group with a disk of said first group positioned at the bottom of said cylindrical chamber such that its opening communicates with one of said fine passageways, said sleeve also including large openings axially displaced from said fine passageways such that as said spool valve member moves past said fine passageways it begins to uncover said large openings.

4,056,126

SPOOL VALVE ARRANGEMENT

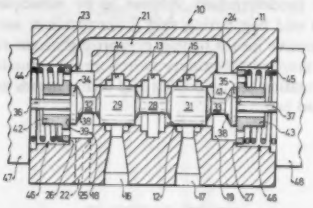
Manfred Hauser, Schwieberdingen, and Werner Schumacher, Asperg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 25, 1976, Ser. No. 661,164

Claims priority, application Germany, Mar. 19, 1975, 2511991

Int. Cl.² F15B *13/044*

U.S. Cl. 137—625.65 **12 Claims**



1. In a valve, a combination comprising a housing having a flow-through passage formed with a fluid-admitting inlet and a pair of fluid-discharging outlets; a pair of pressure-relief chambers each associated with a respective outlet for relieving pressure thereat; a spool slide having respective ends each facing into one of said pressure-relief chambers and also having a pair of lands, said spool slide being mounted in said passage for movement from a neutral position in which said lands prevent communication between said inlet and said outlets and in which communication is also prevented between the latter and their associated chambers, towards operative positions; means for alternatively moving said spool slide from said neutral position towards one of said operative positions so as to permit pressure relief at a respective one of said outlets so that pressurized fluid escaping in a path from said one outlet towards its associated pressure-relief chamber acts on the respective end of said slide which faces the respective chamber and tends to accelerate the movement of said spool slide in a predetermined direction towards said one operative position; and means for counteracting the acceleration of said spool slide, comprising attenuating elements each formed with a deflecting surface extending transversely of said path so as to be directly impinged by the pressurized fluid escaping into the respective pressure-relief chamber in direction opposite to said predetermined direction, to thereby slow the movement of said spool slide towards its respective operative positions.

4,056,127

ACCUMULATOR WITH OPEN ENDED SHELL

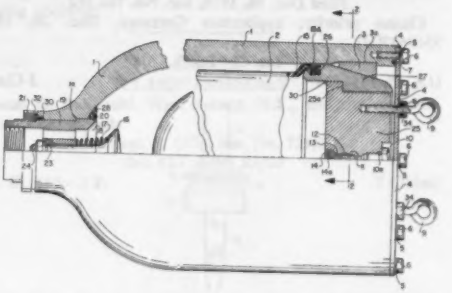
Edward M. Greer, Beverly Hills, Calif., assignor to EMG Hydraulics, Inc., Santa Monica, Calif.

Filed Apr. 30, 1976, Ser. No. 681,788

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **8 Claims**

1. In a pressure accumulator which includes an elongated rigid shell open at one end and having a port formed in the other end thereof; cap means mounted in and enclosing the open end of the shell; a segmented tapered ring fitted into an internal groove at the open end of the shell and engaging the peripheral surface of the cap means for retaining the cap means in the shell; a thimble-shaped flexible bladder positioned in the shell and having a mouth and a rim surrounding said mouth, said mouth being sealed to the inner surface of the shell by the inner peripheral edge of the cap means; and a gas pre-charge valve mounted in said cap means to introduce gas into the interior of said bladder a poppet valve mounted in the port in the other end of the shell, and wherein the cap means comprises a cap having a peripheral shoulder, and a concentric



annular member surrounding the cap, said annular member also having a peripheral shoulder engaging the peripheral shoulder on said cap, and said annular member having a longitudinally inclined peripheral surface engaging the adjacent surface of the tapered ring.

4,056,128

APPARATUS FOR PRODUCING A CONNECTION BETWEEN TWO OVERLAPPING BAND SECTIONS OF A PACKAGE STRIP AND IMPROVED CLOSURE SEAL FOR USE THEREWITH

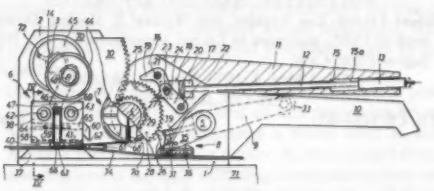
Albert Konrad, Rigistrasse 516, Merenschwand, Switzerland (5634)

Filed Apr. 13, 1976, Ser. No. 676,497

Claims priority, application Switzerland, Apr. 30, 1975, 5556/75

Int. Cl.² B21F *15/06, 9/02*

U.S. Cl. 140—93.4 **8 Claims**



1. An apparatus for producing a connection between two overlapping band sections of a strap placed about a package or the like by means of a closure seal, comprising a band tensioning roll, a closure mechanism for closing the closure seal about the overlapping band ends, an actuation mechanism, said closure mechanism including a punch for closing the closure seal, said punch having a work surface embodying a substantially flat press surface intended to act upon a flap of the closure seal and a curved flanging surface intended to act upon a flange edge of the closure seal, said apparatus further including a housing, a first shaft mounted in said housing, the actuation mechanism comprising an actuation lever pivotable about said shaft, two ratchet wheels mounted on said first shaft within the housing, a first one of the ratchet wheels being rigidly connected with said shaft, a gear rotatably mounted upon said shaft, the second ratchet wheel being connected with the rotatably mounted gear, a toothed segment meshing with the rotatably mounted gear, a second shaft, the toothed segment being secured to the second shaft, said second shaft having a front end carrying a control disk, and a roll eccentrically mounted upon the control disk for acting upon the punch.

4,056,129

CLOSABLE STERILE CONTAINER

Herbert Weiler; Hans Schneider, both of Marburg an der Lahn, and Ludwin Weyrich, Buchenau, all of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed Dec. 16, 1976, Ser. No. 751,162
Claims priority, application Germany, Dec. 20, 1975, 7540657[U]
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—24 2 Claims

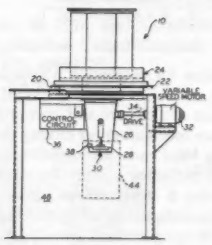
1. Closable sterile container with associated closure cap, characterised in that the closure cap consists of a head plate **8** with pipette **6** and pipette suction means **7**, wherein the pipette wall is designed as a sealing face, and of a connected hollow-cylindrical ring **11**, the perpendicular wall of which has on the inside a surrounding groove **10** and extends from the latter conically outwards, and that both parts of the closure cap are joined together by tear-off bars **9**.

4,056,130

VOLUMETRIC BAGGING APPARATUS

Robert Likens, Los Angeles, and William S. Boehm, Downey, both of Calif., assignors to Likens Manufacturing Co., Huntington Park, Calif.

Filed Mar. 4, 1976, Ser. No. 663,808
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—67 10 Claims



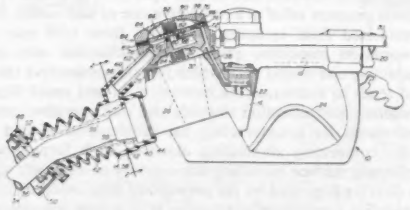
1. In a volumetric bagging apparatus for dispensing a predetermined volume of particulate material into a bag positioned on said apparatus for receipt thereof having filler spout means for providing said particulate material therethrough to said bag, clamp means for releasably retainably positioning said bag at an exit end of said filler spout means for receiving said particulate material therethrough, rotating drum means rotatably positionable adjacent an entrance end of said filler spout means for selectively providing said particulate material to said filler spout during rotation of said drum, brake means for holding said drum against said rotation, and drive means for selectively rotatably driving said drum means; the improvement comprising magnetic control means for indexing said rotatable drum for positioning said drum and releasing said releasably retained bag when said predetermined volume has been dispensed thereto, said magnetic control means comprising a first magnetic cam mounted on said drum means for rotation therewith and a first magnetic proximity switch means mounted adjacent said rotatable drum for actuation by said first magnetic cam means when said first magnetic cam means is in magnetic proximity therewith; said clamp means comprising means responsive to the mounting of an empty bag in said clamp means for providing an actuation signal to said control means; said control means further comprising means responsive to said actuation signal for releasing said drum brake means, activating said drum drive means for initiating said drum rotation and locking said clamp means said first magnetic cam means being mounted on said drum means with respect to said mounted first magnetic proximity switch means for enabling said predetermined volume to be subsequently dispensed into said bag during said drum rotation; said control means responsive means further comprising means responsive to said first magnetic proximity switch means actuation during said drum rotation for unlocking said clamp means and releasing said filled bag.

4,056,131

VAPOR CONTROL IN A FUEL DISPENSING NOZZLE

James W. Healy, 54 Plymouth Road, Wakefield, Mass. 01880

Continuation-in-part of Ser. No. 553,529, Feb. 27, 1975. This application Feb. 9, 1976, Ser. No. 656,124
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—206 36 Claims



1. In a fuel dispensing nozzle comprising a body having a fuel conduit leading to a spout insertable into a fuel tank, a manually operable fuel valve in said fuel conduit, a vapor conduit for transporting vapor displaced from said tank to a remote vapor handling system, and a vapor shut-off valve in said vapor conduit, the improvement wherein said vapor shut-off valve comprises

a first diaphragm having a first surface facing said vapor conduit and a second surface facing a chamber within the nozzle, said first diaphragm causing said vapor conduit to be blocked in a first position of said first diaphragm and not to be blocked in a second position of said first diaphragm, and

biasing means urging said first diaphragm to said first position;

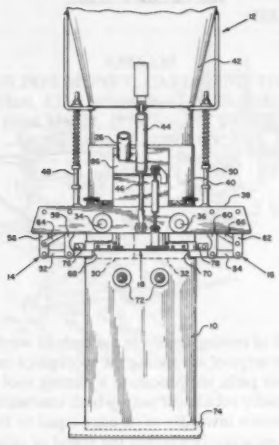
said nozzle further including valve opening means for urging said first diaphragm toward said second position only when fuel is flowing past said fuel valve.

4,056,132

BAG FILLING APPARATUS WITH AIR CONTAMINATE PREVENTION

Charles E. Decrane, West Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Filed Apr. 5, 1976, Ser. No. 673,849
Int. Cl.[2] B65B *3/18*
U.S. Cl. 141—285 10 Claims



1. An apparatus for filling a bag having an open top, comprising in combination:

filling spout means adapted to be received in the open top of the bag,

clamping means for tightly engaging a portion of the top of the bag against the filling spout means,

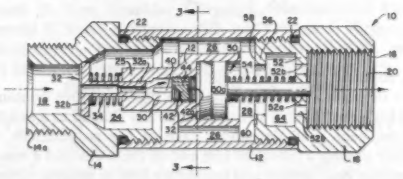
sealing means for sealingly engaging the remaining portion of the top of the bag, said sealing means defining a portion of an enclosed chamber means disposed for sealingly containing the spout means externally above the remaining portion of the top of the bag to prevent escape of contaminates.

4,056,133

FLUID FLOW CONTROL APPARATUS AND A GASOLINE DISPENSING AND VAPOR RECOVERY SYSTEM UTILIZING SAID APPARATUS

Elmer M. Deters, Muscatine, Iowa, assignor to Weil-McLain Company, Inc., Dallas, Tex.

Filed Apr. 19, 1976, Ser. No. 677,983
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—301 8 Claims



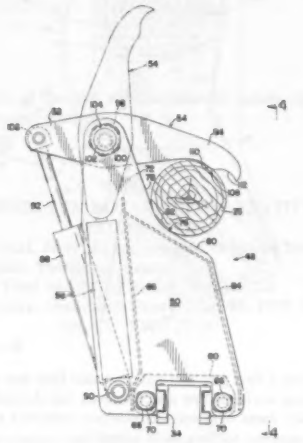
1. A control apparatus for controlling the flow of fluid comprising a housing adapted to receive fluid, passage means in said housing for permitting the flow of fluid through said housing, a control member disposed in said housing and movable relative to said housing in response to variations in the flow rate of said fluid through said passage means, means for defining a chamber in said housing, a valve member movable in said chamber between a position in which it prevents fluid flow through said passage means and a position in which it permits fluid flow through said passage means, means urging said valve member to its fluid flow permitting position, and means cooperating with said control member for selectively permitting a portion of said fluid to flow into said chamber in response to said control member attaining a predetermined position in said housing thus forcing said valve member to its fluid flow preventing position.

4,056,134

CLAMP ASSEMBLY

Thomas G. Bakowski, West Seneca, N.Y., assignor to Eaton Yale Ltd., Canada

Filed Sept. 7, 1976, Ser. No. 721,015
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—2 Z 7 Claims



1. In apparatus for processing trees including a substantially horizontal processing boom, means for depositing a cut tree on said processing boom, and delimber means engageable with said cut tree and movable along said processing boom to delimb said tree;

a clamp assembly mounted on said processing boom in position to receive a tree deposited on said processing boom, said clamp assembly comprising a frame fixed to said boom; a first tree engaging surface formed on said frame and disposed at an angle extending downwardly from the horizontal; a clamp arm pivotally mounted to said frame and having a second tree engaging surface formed thereon; and means for moving said arm from a first position out of the way of a tree being deposited on said boom and a second position putting said second tree engaging surface in clamping engagement with a tree on said first tree engaging surface, said second tree engaging surface comprising a first convex surface element engageable with a tree placed on a first area of said first tree engaging surface and a second concave surface element engageable with a tree placed on a second area of said first tree engaging surface.

4,056,135

CLAMP ASSEMBLY

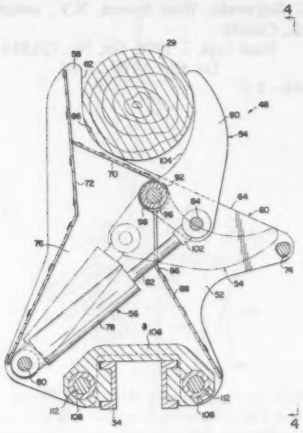
Paul H. Whitcomb, Attica, N.Y., assignor to Eaton Yale Ltd., Canada

Filed Sept. 17, 1976, Ser. No. 724,143
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—2 Z 11 Claims

1. In apparatus for processing trees including a substantially horizontal processing boom, means for depositing a cut tree on

said processing boom, and delimber means engageable with said cut tree and movable along said processing boom to delimb said tree:

a clamp assembly mounted on said processing boom in position to receive a tree deposited on said processing boom, said clamp assembly comprising a frame fixed to said boom; a first tree engaging surface formed on said frame at least a portion of which is disposed at an angle extending downwardly from the horizontal; a clamp arm pivotally mounted to said frame and having a second tree engaging surface formed thereon; and means for moving said clamp



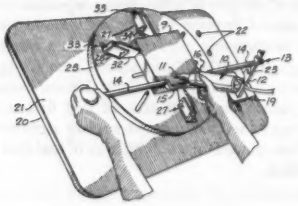
arm from a first position wherein said first and second tree engaging surfaces are spaced apart for deposit of a tree between them to a second position wherein said second tree engaging surface is in clamping engagement with a tree on said first tree engaging surface; the improvement wherein said clamp arm is located beneath said first tree engaging surface when said clamp arm is in its first position, to place said second tree engaging surface beneath said first tree engaging surface, whereby no portion of said clamp arm is in position to interfere with a tree being deposited on said processing boom.

4,056,136

PORTABLE TOOL GUIDE

Donald M. Miller, 1005 North Ave., Sunnyside, Wash. 98944

Filed July 12, 1976, Ser. No. 704,469
Int. Cl.² B27C *5/02*
U.S. Cl. 144—134 D **10 Claims**



1. A guide for a portable tool having a workpiece-engaging element aligned along a movable axis for surfacing operations, comprising:

a rigid elongated maulstick comprising a shaft having two side sections extending outward from each side of an integral offset yoke at its center;

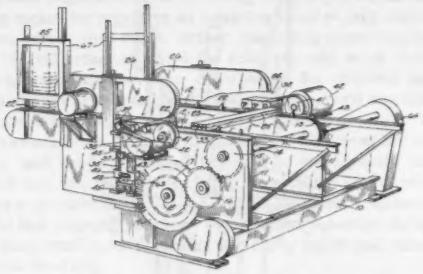
and means for mounting a portable tool to the yoke of the maulstick for pivotal motion of the portable tool relative to the maulstick about an axis perpendicular to the movable axis of its workpiece-engaging element.

4,056,137

METHOD AND APPARATUS FOR CUTTING TENONS

Ronald J. Morasch, and Robert J. Webb, both of Oshkosh, Wis., assignors to Medalist Industries, Inc., Milwaukee, Wis.

Filed June 25, 1975, Ser. No. 590,241
Int. Cl.² B27F *1/08*
U.S. Cl. 144—323 **19 Claims**



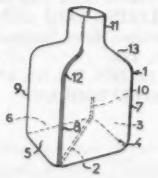
1. A method of cutting tenons in the ends of workpieces and comprising the steps of advancing the workpiece on a substantially rectilinear path, reciprocating a cutting tool on a transverse, substantially rectilinear path which intersects the workpiece for a distance inwardly of its edge equal to the length of a tenon and concurrently varying the speed of advance of the workpiece and the speed of reciprocation of the cutting tool so that the cutting tool has an effective undulating cutting path with respect to the workpiece which is a composite of the variation in workpiece speed and cutting tool speed, thus forming a series of spaced tenons thereon.

4,056,138

FLEXIBLE PLASTIC CONTAINER

Gaston Fagniart, Valenciennes, France, assignor to Societe Anonyme dite: BORACIER, Switzerland

Filed Mar. 24, 1976, Ser. No. 669,975
Claims priority, application France, Apr. 3, 1975, 75.11149
Int. Cl.² B65D *1/00*
U.S. Cl. 150—.5 **3 Claims**



1. A foldable container, comprising:

walls of plastic material defining a homogeneous container of high mechanical strength generally shaped as a polyhedron, each wall defining a face of the polyhedron, the body having a mouth at one end of the walls and a base at another end thereof and having a plane of general symmetry extending between such walls diagonally of the polyhedron; and

preliminary folds integral with such walls and with portions of the base, extending in the immediate vicinity of and along the plane of general symmetry, to interconnect such walls and base portions and to permit the container body to be folded about the preliminary folds, said folds having a general cross-sectional shape of a W extending into the interior of said container body, the W being offset relative

to said body to a slight extent such that one pair of the walls, when the body is folded, practically adjoins another pair of the walls of the polyhedron,

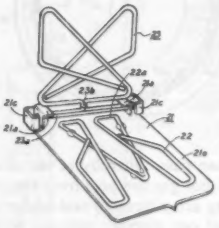
whereby said container body is slightly asymmetrical relative to said plane of general symmetry, and storage of the folded container body, as well as the folding thereof, is thus facilitated.

4,056,139

HOLDER FOR MONEY, CARDS AND THE LIKE

Edward M. Murt, 831 Medway Road, Philadelphia, Pa. 19115

Filed Mar. 3, 1976, Ser. No. 663,298
Int. Cl.² A45C *11/18*; B42F *1/00*
U.S. Cl. 150—39 **13 Claims**



1. A holder for money, cards, or the like comprising:

a. a side cover,

b. a first clip substantially immovably secured directly to the inside surface of said side cover, said clip having two portions normally urged resiliently into contact with one another and lying in generally parallel adjacent planes, said two portions clasping said money or the like between them, and

c. a second clip having two generally parallel portions normally urging resiliently toward one another to clasp money or the like between them, said second clip being spaced from said first clip and disposed for pivotal movement and to lie over said first clip in a genrally parallel relation thereto in a mounting which is connected to said side cover and spaced from said first clip.

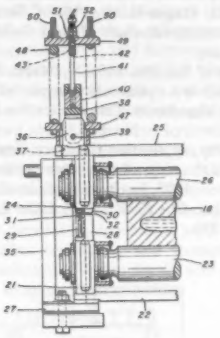
4,056,140

METHOD AND MECHANISM FOR CONTROLLING FORCES IN A CONTINUOUS-CASTING MACHINE

Kenneth D. Ives, Franklin Township, Westmoreland County; Ronald S. Vranka, Monroeville, and George J. Wagner, Jr., North Fayette Township, Allegheny County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 20, 1976, Ser. No. 734,066
Int. Cl.² B21B *37/08*; B22D *11/12*
U.S. Cl. 164—4 **16 Claims**

1. In a continuous-casting operation in which a partially solidified casting having a liquid core travels between a series of opposed roll-pairs which guide the casting and confine it against bulging, the rolls of each pair being journaled for rotation on relatively fixed but adjustable axes and having a gap of predetermined dimension therebetween and in which the force exerted between the roll-pairs and casting is measured at each roll-pair, an improved method of controlling forces exerted between the rolls and casting to prevent the casting from bulging if the gap is too large and to prevent improper stresses in the casting and rolls or the gap is too small, said method comprising utilizing deviations in the force measurement from the norm to locate improperly gapped roll-pairs and correcting



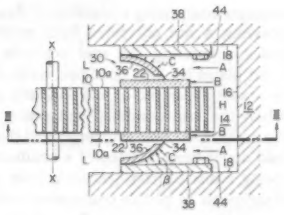
the dimension of the gap with adjustment means operatively connected to each roll pair.

4,056,141

SEAL ASSEMBLY IN ROTARY REGENERATIVE HEAT EXCHANGER

Yoshihiro Sakaki, Suwa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 3, 1976, Ser. No. 663,231
Claims priority, application Japan, Mar. 25, 1975, 50-34943
Int. Cl.² F28D *21/00*
U.S. Cl. 165—9 **7 Claims**



1. In a rotary regenerative heat exchanger including a stationary housing member and a heat-transferring member which is cylindrical and rotatable on the longitudinal axis thereof for heat exchange between a first fluid stream of a relatively high pressure and a second fluid stream of a relatively low pressure, the housing member having a surface opposite to and spaced from a portion of an end face of the heat-transferring member, and a seal assembly for preventing leakage of the first fluid into the second fluid along said end face of the heat-transferring member, said seal assembly comprising:

a seal member placed on said end face of the heat-transferring member and loosely joined with said surface of the housing member such that said seal member is movable vertically to said end face;

a support plate fixedly placed on said surface; and

a shield plate of a resilient material fixed at one end to said support plate to extend from said support plate obliquely towards said end face of the heat-transferring member such that an acute angle is formed between said surface and one side of said shield plate to be exposed to the first fluid, the extended end of said shield plate being in sliding contact with said seal member at a surface opposite to said surface of the housing member.

4,056,142
HEAT EXCHANGE ARRANGEMENT

Hans Baumann, Essen; Manfred Halfmann, Ravolzhausen, and Rudolf Janke, Hagen-Halden, all of Germany, assignors to GEA Luftkuhlergesellschaft Happel GmbH & Co. KG, Bochum, Germany

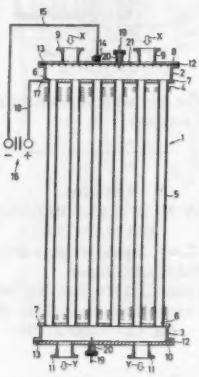
Continuation of Ser. No. 448,379, March 5, 1974, Pat. No. 3,951,207, which is a continuation-in-part of Ser. No. 396,118, Sept. 10, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 643,509

Claims priority, application Germany, Sept. 9, 1972, 2244331

The portion of the term of this patent subsequent to Apr. 20. 1993, has been disclaimed.

Int. Cl.[2] F28F *19/02*; C23F *13/00*

U.S. Cl. 165—133 **8 Claims**



1. A heat exchanger comprising a plurality of fluid conduits adapted for receiving a hot corrosive fluid medium to be cooled; end plates connecting the said conduits; openings formed in said end plates for said conduits; walls forming an inlet chamber provided at one end of said conduits; a cover for said inlet chamber, the said conduits, end plates and walls forming the main body of the heat exchanger and the said main body and the said cover being formed of a conductive metal, the said cover being insulated from said main body of the heat exchanger, and terminals to permit connection with opposite poles of a source of direct current, one for said cover and the other for said main body, to cause flow of a current when an electrolytically active fluid is passed through said heat exchanger whereby a protective coating against corrosion is caused to form throughout the fluid-wetted surface of said cover and main body.

4,056,143
HEAT EXCHANGE APPARATUS

Barrie James Martin, Shenfield, England, assignor to The Plessey Company Limited, Ilford, England

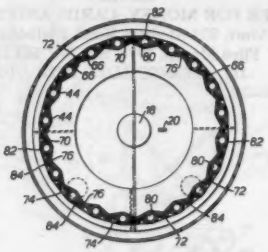
Continuation-in-part of Ser. No. 411,135, Oct. 30, 1973, abandoned. This application Apr. 8, 1976, Ser. No. 675,201

Claims priority, application United Kingdom, Nov. 8, 1972, 51451/72

Int. Cl.[2] F24B *5/02*; F28F *1/32, 9/02*

U.S. Cl. 165—176 **6 Claims**

1. A heat exchange unit for use in a central heating system, which heat exchange unit comprises in combination:
   1. a housing;
   2. a liquid conducting array of parallel pipes so arranged as to enclose an area, said pipes being spaced inwardly of said housing to define a gas chamber between said pipes and said housing;
   3. a gas outlet in said gas chamber;
   4. upper and lower liquid chambers communicating with said pipes whereby liquid can be passed through said pipes;
   5. heat conducting material woven around said pipes with said heat conducting material extending substantially transverse to said pipes and being in contact with said pipes and with itself;
   6. a metallic coating on said heat conducting material and said pipes adhering said heat conducting material to said pipes and to itself to form said heating conducting material and said pipes into a solid body having spaces between said heat conducting material and said pipes through



which hot gas can pass, whereby in use of said heat exchange unit said hot gas can pass from the center of said liquid conducting array through said spaces and into said gas chamber and out through said gas outlet and heat conducting material passing around said pipes to cross over itself between said pipes, and wherein more heat conducting material is wound around the outside of said pipes, and metal rods are positioned in gaps formed between said pipes and said crossover points, said rods being adhered to said pipes and to said conducting material by said metallic coating.

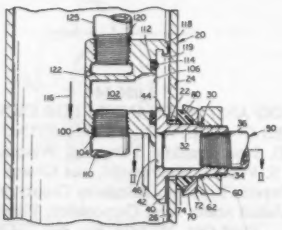
4,056,144
POSITIVE SEAL PITLESS WELL ADAPTER

William Wellstein, P.O. Box 430, Fostoria, Ohio 44830

Continuation-in-part of Ser. No. 660,396, Feb. 23, 1976. This application Dec. 6, 1976, Ser. No. 747,902

Int. Cl.[2] E21B *33/03*

U.S. Cl. 166—85 **64 Claims**



1. In an adapter for a side duct to a main duct having an outer cylindrical convex surface and having a radial hole through said surface, said adapter comprising:
   A. a nipple having an outer cylindrical surface and having its axis extending radially outwardly from its inner end held in said hole, said side duct being connected to the outer end of said nipple,
   B. sleeve means around said nipple comprising a nut means threaded on said nipple at the outer end of said nipple,
   C. a gasket between said sleeve means and said main duct for engagement with both the outside cylindrical surfaces of said main duct and of said nipple,

the improvement comprising:

D. a frusto-conical seat on said sleeve means for said gasket, and

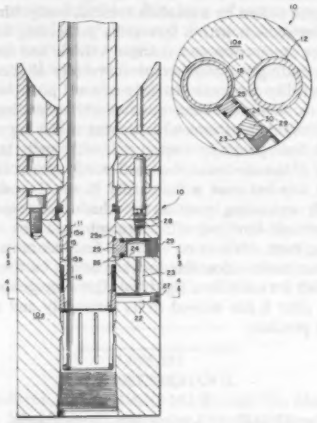
F. a saddle-shaped surface on one of said gasket and said seat contoured to substantially conform with the junction intersection between said main duct and said side duct, whereby axial thrust by said nut means against said gasket in said seat compressingly seals said gasket both against the outer cylindrical convex surface of said main duct and the outer cylindrical surface of said nipple.

4,056,145

HYDRAULIC HOLDDOWN FOR WELL PACKER STINGER

Marion Barney Jett, and Dennis Mitchel Spriggs, both of Dallas, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 28, 1975, Ser. No. 626,415
Int. Cl.[2] E21B *23/00, 33/122*
U.S. Cl. 166—212 **5 Claims**



1. A relatch stinger mechanism for multi-string well packers, comprising:

body means having bore passage means therethrough adapted to receive a plurality of conduit strings telescopically therein;

latch means in said body means for securing the remainder of the conduit strings in said body means when one conduit string is removed therefrom; and,

hydraulic lock means in said body means communicating with pressure acting below the well packer and adapted to be engaged in response to said pressure into restraining abutment with a conduit string in said bore passage means.

4,056,146

METHOD FOR DISSOLVING CLAY

Bobby E. Hall, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed July 6, 1976, Ser. No. 702,813
Int. Cl.[2] E21B *43/27*
U.S. Cl. 166—300 **15 Claims**

1. A method of dissolving clay comprising treating said clay with at least a one-stage treatment of at least two different chemicals, in alternate slugs, said one stage being comprised of

contacting said clay with a slug of a first chemical and thereafter

contacting said clay with a slug of a second chemical different from said first chemical to thereby form hydrofluoric acid on the surface of said clay,

wherein said first chemical supplies one of hydrogen ions or fluoride ions and said second chemical supplies fluoride ions, if hydrogen ions are supplied by said first chemical, or hydrogen ions if fluoride ions are supplied by said first chemical wherein said chemical supplying said fluoride ions is an aqueous solution of a fluoride-containing chemical selected from the group consisting of ammonium bifluoride, ammonium fluoride, and mixtures thereof.

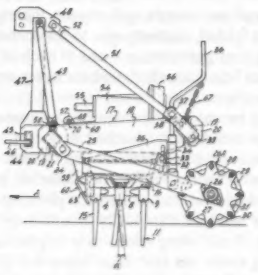
12. A method of acid treating a subterranean sandstone formation comprising contacting said formation with an aqueous hydrochloric acid solution containing about 5 percent hydrochloric acid by weight of solution, contacting said formation with an aqueous solution containing about 3 percent hydrofluoric acid and about 12 percent hydrochloric acid by weight of solution, contacting said formation with at least one stage of a clay dissolving system wherein said stage consists of an aqueous solution containing about 3 percent ammonium fluoride by weight of solution, followed by an aqueous solution containing about 5 percent hydrochloric acid by weight of solution and thereafter contacting said formation with a 5 percent by weight solution of hydrochloric acid or a 3 percent by weight solution of ammonium chloride.

4,056,147

ROTARY HARROWS

Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Continuation of Ser. No. 436,956, Jan. 28, 1974, abandoned, which is a continuation of Ser. No. 283,337, Aug. 24, 1972, abandoned. This application Aug. 13, 1975, Ser. No. 604,243
Claims priority, application Netherlands, Aug. 31, 1971, 7111947
The portion of the term of this patent subsequent to Aug. 12, 1992, has been disclaimed.
Int. Cl.[2] A01B *33/06, 33/16*
U.S. Cl. 172—68 **10 Claims**



10. A harrow comprising a frame having coupling means connectable to the lift of a tractor and a plurality of rotatable soil-working members mounted on said frame in a row extending transverse to the direction of travel, said soil-working members comprising tines mounted for rotation about upwardly extending axes that are supported on an elongated frame part of said frame, an elongated roller coextending with said row and said roller being connected to said frame and positioned at the rear thereof to trail behind said soil-working members, said frame part depending from an elongated supporting structure and the latter comprising a front beam and a rear beam that coextend with said frame part, forwarding extending arms said roller being connected to said arms, said arms being connected to said rear beam by adjustment means for varying the position of said arms up and down relative to said supporting structure connected to said arms intermediate the ends thereof, locking means positioned adjacent the lateral ends of said frame part for locking said arms against movement relative to said supporting structure, and said locking means being connected to said arms being pivotally connected to the front part of said supporting structure and intermediate the ends thereof, said arms being fixable in chosen angular settings about their pivot connections to said frame by said locking

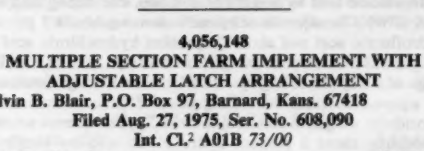
means, said roller including a central tube-like support and a plurality of rod-like elements being spaced from said support, said rod-like elements extending generally transverse to the direction of travel and being helically positioned with respect to the center line of the said tube-like support, holes on said roller for supporting said rod-like elements and, means for detachably mounting said rod-like elements in said holes.

4,056,148

MULTIPLE SECTION FARM IMPLEMENT WITH ADJUSTABLE LATCH ARRANGEMENT

Calvin B. Blair, P.O. Box 97, Barnard, Kans. 67418

Filed Aug. 27, 1975, Ser. No. 608,090
Int. Cl.[2] A01B *73/00*
U.S. Cl. 172—311 **10 Claims**



1. In a multiple section farm implement having a main frame and a wing frame which is rearwardly foldable from an operating configuration to a transporting configuration, and vice versa said wing frame being adapted for mounting of soil conditioning members thereon and having elongated, flexible reinforcing members attached thereto which extend to said main frame, the improvement comprising:

a. swinging arm members which are pivotally attached near their inner ends to the main frame and are pivotable forwards and backwards with respect thereto when said wig frame is folded, respectively, to an operating and a transporting configuration, one end of each of said reinforcing members being attached near the outer ends of one of said arm members,

b. latching means associated with said main frame whereby said arm members are latched with said reinforcing member one ends adjacent said main frame when said wing frame is in an operating configuration and whereby the arm members are unlatched for pivoting said reinforcing member one ends outwardly of said main frame during the folding of said wing frame to transporting configuration.

c. a lifting tower on said main frame for pivoting the wing frame, said lifting tower including a lever pivotally attached at one end to the main frame, an interconnecting link which is pivotally attached to said lever toward the other end thereof, said link extending rearwardly from said lever and being pivotally attached at its rear end of the wing frame,

d. an actuator rod pivotally attached at one end to said lever and in operational engagement with said latching means at the other end, the latching means being pivotal back and forth by said rod for unlatching said arm members upon pivoting the wing frame from an operating configuration to an intermediate configuration, and for latching said arm members when said wing frame is folded to an operating configuration, and

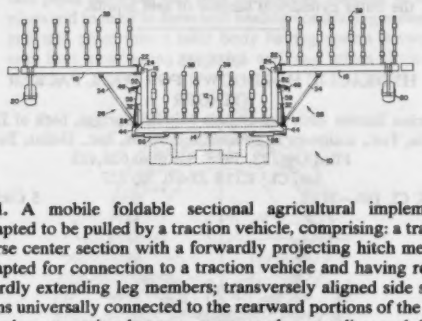
e. said latching means having means forming a sleeve passageway through which said rod extends and with respect to which said rod is longitudinally reciprocable, at least one engagement member mounted on said rod and selectively spaced from and engageable with said passageway forming means during movement of said rod with respect to said pasageway and being adjustable in position along said rod, whereby latching of said swinging arm members may be adjustably synchronized with the folding of said wing frame.

4,056,149

REARWARDLY FOLDING IMPLEMENT

Darrel Lee Honnold, Winterset, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 8, 1976, Ser. No. 665,067
Int. Cl.[2] A01B *23/04, 73/00, 61/00*
U.S. Cl. 172—311 **12 Claims**



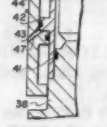
1. A mobile foldable sectional agricultural implement adapted to be pulled by a traction vehicle, comprising: a transverse center section with a forwardly projecting hitch means adapted for connection to a traction vehicle and having rearwardly extending leg members; transversely aligned side sections universally connected to the rearward portions of the leg members to swing between transversely extending and fore and aft extending positions with respect to the leg members; a first rigid link pivotally connected with each leg member forwardly of the aforesaid rearward portion for rotation about a vertical axis between a forwardly directed position and a rearwardly extending position in which the respective side section extends fore and aft; a second rigid link universally connecting each side section with the first link of its respective leg member; and a releasable locking means on the respective leg member for each first rigid link that engages and secures the latter after it has moved to its forwardly and rearwardly extending position.

4,056,150

RAM DEVICE

Johann Daniël Meijer, Appingedam, Netherlands, assignor to N.V. Appingedammer Bronsmotorenfabriek, Netherlands

Continuation of Ser. No. 252,317, May 11, 1972, abandoned, and a continuation of Ser. No. 495,202, Aug. 6, 1974, abandoned.
This application Jan. 9, 1976, Ser. No. 647,818
Int. Cl.[2] E02D *7/08, 7/10*
U.S. Cl. 173—127 **7 Claims**



1. A pile driving drop hammer comprising, in combination, a vertically oriented cylinder adapted to be mounted above a pile and having a bore and a cylinder wall; a piston movable in said bore; a drop weight connected to said piston and operable, when dropped, to ram ;he pile into the ground; a sleeve valve movable inside said cylinder and operable to cover and to block ports formed in said cylinder wall, said ports including a first set of ports communicating with a supply of pressurized air and a second set of ports communicating directly with the ambient external atmosphere, the ports of at least said second set being distributed around said cylinder wall and having a flow cross-section sufficiently large to offer only a minimal

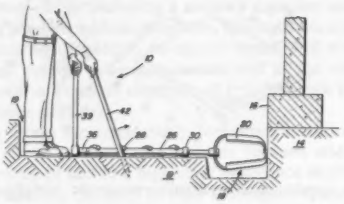
resistance to flow of air therethrough; said sets of ports being spaced apart from each other axially of said cylinder wall; piston means on said sleeve valve movable in a separate part of said cylinder sealingly separated from said bore in which said drop weight connected piston is movable; and control means selectively operable to connect said separate cylinder part to a source of pressurized air to subject said piston means to pressurized air to move said sleeve valve axially of said cylinder; the sleeve part of said sleeve valve having an axial length sufficiently greater than the axial spacing of said sets of ports that, upon axial movement of said sleeve valve, said sleeve part blocks communication between one set of ports and the interior of said cylinder bore beneath said drop weight connected piston before establishing communication between the other set of ports and the interior of said piston bore beneath said drop weight connected piston; said sleeve valve and said sets of ports being relatively arranged in a manner such that, upon establishing of communication between said first set of ports and the interior of said cylinder bore beneath said drop weight connected piston, following blocking of communication between said second set of ports and the interior of said cylinder bore beneath said drop weight connected piston, pressurized air is admitted through said sleeve valve to said cylinder bore beneath said drop weight connected piston to lift said drop weight connected piston and, upon establishment of communication between said second set of ports and the interior of said cylinder bore beneath said drop weight connected piston, following blocking of communication between said first set of ports and the interior of said cylinder bore beneath said drop weight connected piston, the pressurized air escapes directly to the ambient external atmosphere through said second set of ports with a minimum resistance to air flow, until said drop weight connected piston has dropped to its lowermost position to impact said drop weight against the pile to ram the pile into the ground.

4,056,151

EXCAVATING TOOL

Dennis J. Sullivan, 305 S. Idaho Ave., Grangeville, Idaho 83530

Filed Mar. 29, 1976, Ser. No. 671,362
Int. Cl.² B23Q *5/00*
U.S. Cl. 173—141 **9 Claims**



1. An excavating tool comprising: means of simple construction, very durable and maintenance free, and easy to operate by the ordinary unskilled laborer including; and easily replaceable auger head for excavating earth and the like, drive means attached to said auger head for rotating same for excavating purposes, second means associated with the drive means for applying pressure to the auger head in a substantially longitudinal direction to force the auger head to bite into the earth, the drive means attached to said auger head being a substantially long rod member, third means being secured to the other end of said rod member from the auger head for attachment to a ratchet actuating mechanism, the second means associated with the drive means for applying pressure to the auger head including a longitudinally extending tube member covering and enclosing a substantial intermediate portion of sid rod member between the auger head and the ratchet mechanism, and the second means including at least one perpendicular cross member attached to the outer side of said tube member and engaged by external ground engaging means for applying lateral pressure thereto.

4,056,152

DRILL BIT FOR REINFORCED CONCRETE

Patrick J. Lacey, 247 Hollywood Ave., Crestwood, N.Y. 10707

Filed Oct. 14, 1976, Ser. No. 732,268
Int. Cl.² E21B *9/36*
U.S. Cl. 175—330 **3 Claims**

1. A bit to be driven by a rotary machine for drilling concrete containing metal reinforcements, said bit comprising:

a. a body having a coupling at its inner end for connection to said machine and having a hollow-stem extending outwardly from said coupling and terminating in an annular cutting face at its outer end;

b. The cutting face comprising a saw-tooth shape having multiple abrupt leading step portions facing in the direction of rotation of the bit, and having multiple trailing portions sloping circumferentially at a substantially constant angle away from the apex of each step portion to the root of the next succeeding step portion;

c. a hardened cutter insert secured against the leading edge of each step portion and having a cutting edge extending outwardly of the drill beyond the apex of the step, and having an inner end recessed in a slot in the hollow stem adjacent to the root of the step, each cutter insert being raked away from the direction of rotation of the bit;

d. the trailing portions of the annular saw-tooth face having surfaces sloping radially outwardly away from the center of the stem and axially away from its outer end so that cuttings are displaced away from the center of the bit toward the periphery of the hole being drilled;

e. the surfaces of said trailing portions of the saw-tooth face having diamond chips bonded thereto, the chips being recessed below the cutting edges of the hardened inserts; and

f. the outer surface of the stem being longitudinally recessed to provide an escape channel for cuttings which extends axially along the stem from a location immediately in front of each insert toward the inner end of the stem and past the slot which supports the adjacent insert.

4,056,153

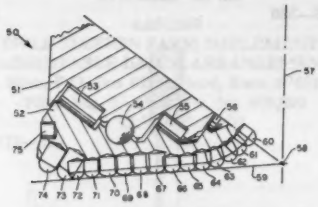
ROTARY ROCK BIT WITH MULTIPLE ROW COVERAGE FOR VERY HARD FORMATIONS

Raul A. Miglierini, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 581,998, May 29, 1975, abandoned. This application July 16, 1976, Ser. No. 705,963
Int. Cl.² E21B *9/08*
U.S. Cl. 175—376 **5 Claims**

1. A three cone rotary bit for drilling by disintegrating the

formations at the bottom of a borehole, comprising: a head; three bearing pins extending from said head; and three rolling cutters of generally conical configuration, each cutter rotatably mounted upon a respective bearing pin, each of said cutters having a nose and a base and each of said cutters having intermediate circumferential rows of individual mounted in sockets in said cutters with said intermediate rows being



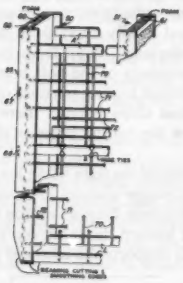
spaced between said nose and base so that in a majority of instances the track of an intermediagte row of one cutter on the bottom of the borehole at least partially overlaps the track of an intermediate row of one of the other cutters on the bottom of the borehole, said intermediate circumferential rows of inserts being completely out of intermesh and a composite of the inserts of said intermediate rows of all three cutters having the tips of the inserts forming substantially a straight line.

4,056,154

SQUARING OFF AND REAMING TOOL FOR DEEP ELONGATED TRENCH EXCAVATIONS

George John Tamaro, Leonia, N.J., assignor to Icos Corporation of America, New York, N.Y.

Division of Ser. No. 603,982, Aug. 12, 1975, Pat. No. 4,005,582.
This application July 2, 1976, Ser. No. 701,761
Int. Cl.[2] E02D *17/148*
U.S. Cl. 175—416 1 Claim



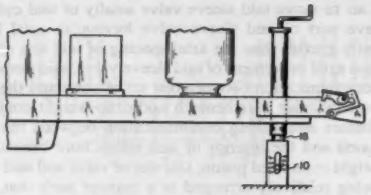
1. A tool for squaring off and evening out the walls of an elongated trench excavation comprising a parallel pair of spaced steel beams, a plurality connecting steel lattice bars maintaining said beams in spaced parallel relation, and means forming reaming, cutting and smoothing edges on the lower edges of said beams and the lower steel connecting lattices for the walls of said elongated excavation to square off and smooth same and means for lifting and dropping said tool in said elongated trench excavation.

4,056,155

PORTABLE TRAILER TONGUE WEIGHT SCALE

Martin H. Wahl, R.D. 2, Box 53, Evans City, Pa. 16033

Filed Mar. 1, 1976, Ser. No. 662,712
Int. Cl.[2] G01G *3/02*
U.S. Cl. 177—145 7 Claims



1. A portable scale for receiving the jack tube of a trailer tongue to provide trailer tongue load weight comprising:

a cylindrical tubular housing having a closed end and an open end which receives the jack tube of a trailer tongue;

a weight sensitive device disposed within said tubular housing and being recessed from the open end of said tubular housing;

a sleeve secured to the inner diameter of said housing and extending between the open end of said housing and said weight sensitive device;

a weight scale disposed on the outside circumference of said tubular housing; and,

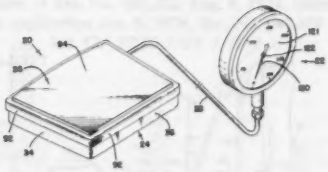
indicator means connected to said weight sensitive device for movement relative to said weight scale whereby the applied load weight is indicated.

4,056,156

WEIGHING DEVICE

Arnold J. Dayton, 12718-37th Ave. NE., Seattle, Wash. 98125

Filed Aug. 12, 1976, Ser. No. 713,850
Int. Cl.[2] G01G *5/04*
U.S. Cl. 177—209 17 Claims



1. A combination hydraulic-pneumatic weighing device comprising:

a. a base member including a bottom wall and upstanding side walls defining an upwardly open scale housing,

b. a plurality of hydraulic fluid-containing, load-receiving members supported in said base member, said load receiving members having a manifold housing including an upwardly open manifold cavity and a downwardly movable member disposed above said manifold cavity for limited vertical movement and also including a metallic bellows member sealingly secured to both said movable member and manifold housing and together with said manifold cavity defining a load cell cavity, said manifold housing including at least one fluid opening connected to said manifold cavity to be interconnected by fluid passage means with another load receiving member, said plurality of load-receiving members being filled with hydraulic liquid and interconnected for movement of said hydraulic liquid,

c. a platform section mounted on said base member in such

a way as to apply a weight thereon generally equally to said plurality of load-receiving members,

d. conduit means interconnecting at least one of said load-receiving members and a weighing scale device and also being substantially completely filled with hydraulic liquid, said conduit and said plurality of load-receiving members being interconnected so as to cumulatively displace a predetermined amount of hydraulic liquid in response to a predetermined amount of weight being applied to said load receiving member, and,

e. said weighing scale device including a weight indicator which is actuated by a column of air compressed by said displaced hydraulic liquid.

4,056,157

ELECTRONIC SPEED CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES

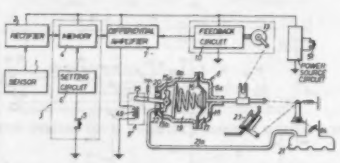
Shoji Kawata, Okazaki, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 5, 1976, Ser. No. 711,807

Claims priority, application Japan, Aug. 8, 1975, 50-96857

Int. Cl.² B60K *31/00*

U.S. Cl. 180—105 E **9 Claims**



1. In an electronic control system for use in automatically controlling the speed of a vehicle having an actuator for a throttle valve of the vehicle, comprising:

means for generating a speed signal voltage proportional to the actual speed of the vehicle;

a memory circuit including a memory capacitor and a first high input impendance amplifier, said capacito: connected at one end thereof to an output terminal of said speed signal voltage generating means and at the other end thereof to a control electrode of said first high input impedance amplifier;

setting means for momentarily connecting a constant voltage circuit to a common junction between said control electrode of said first high input impedance amplifier and said memory capacitor to store a command speed voltage in said memory capacitor in response to said speed signal voltage generated by said speed signal voltage generating means; and

a comparison circuit connected to said memory circuit for operating said throttle valve actuator by comparing the output voltage of said first high input impedance amplifier with a reference voltage;

wherein said setting means comprises a second high input impendance amplifier having an input terminal connected to said constant voltage circuit and having an output terminal connected to said common junction between said memory capacitor and said first high input impedance amplifier, and manual control means connected to the control electrode of said second high input impedance amplifier to normally deenergize said second high input impedance amplifier and to momentarily energize said second high input impedance amplifier upon actuation of said manual control means.

4,056,158

ROUGH TERRAIN VEHICLES

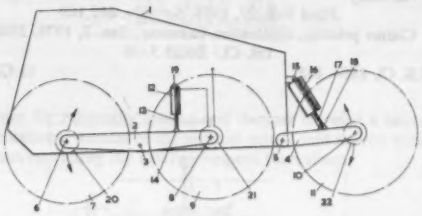
Roderick Buchan Ross, Bordon, England, assignor to Minister of Agriculture, Fisheries & Food, in Her Britanic Majesty's Government of the U.K. of Great Britain & N. Ireland, London, England

Filed Apr. 15, 1976, Ser. No. 677,442

Claims priority, application United Kingdom, Apr. 16, 1975, 15739/75

Int. Cl.² B62D *11/02*

U.S. Cl. 180—6.48 **8 Claims**



1. A vehicle comprising a rigid frame supported upon a plurality of wheels and skid-steerable by rotation upon a transverse pair of said wheels, each wheel of said transverse pair being called herein a pivot wheel, an operator-commandable transmission control system, hydraulic drive motors under the control of fluid transmission lines from said control system for independently driving at least the two pivot wheels, and hydraulic loading means downwardly operative upon each pivot wheel, each of said hydraulic loading means being in fluid connection with the fluid transmission line of one of said hydraulic drive motors and so constructed and arranged that fluid pressure developed within said one hydraulic drive motor by rotational resistance at its driven wheel acts via the hydraulic, loading means to increase ground pressure at the said pivot wheel.

4,056,159

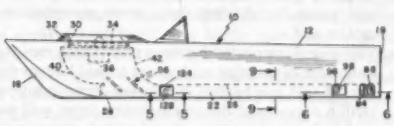
AIR CUSHION VEHICLE

Carmi Goodrich Evans, Hoddview Mobile Estates, Rte. 1, Space 12, Hubbard, Oreg. 97032

Filed July 12, 1976, Ser. No. 704,232

Int. Cl.² B60V *1/08*

U.S. Cl. 180—120 **4 Claims**



1. An air cushion vehicle, comprising:

an elongated body having a forward bow portion, a stern, and a lower portion with a floor and side walls defining a longitudinal, rearwardly opening air channel in the underside thereof;

a duct in said bow portion having a driven impeller therein;

a plenum chamber extending from and having an outlet communicating with said air channel;

valve means in said outlet for directing air flow from the plenum chamber selectively downwardly, rearwardly and forwardly;

trim rudder means mounted in the rear portion of said air channel for selectively obstructing portions of the air channel;

and steering means for diverting air flow from said air channel through portions of said side walls, said steering means including rearwardly opening tunnels in the rear portions

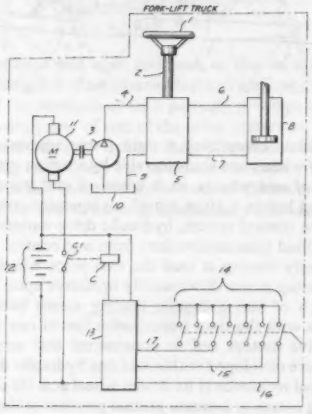
of said side walls, said tunnels having inlets from said air channel forwardly of said trim rudder means, and directional control rudders pivotally mounted in said tunnels adjacent the rear openings thereof.

4,056,160

ELECTRICALLY POWERED VEHICLE WITH POWER STEERING

Theodor Abels, and Siegfried Puschel, both of Aschaffenburg, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Feb. 27, 1976, Ser. No. 662,165
Claims priority, application Germany, Jan. 3, 1975, 2508938
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—143 **11 Claims**



1. A vehicle comprising a battery;
an electrically-operated propulsion system;
switch means for connecting said battery to said propulsion system and having a range of speeds including relatively low speeds and at least one relatively high speed and, corresponding thereto, a high speed position and at least one lower speed position;
a hydraulically operable power steering mechanism for steering said vehicle, said mechanism including a hydraulic pump and an electric motor operatively connected to said pump for driving same upon energization of said motor; and
circuit means connected between said switch means and said motor for connecting said motor to said battery for operation of said mechanism in a lower speed position of said switch means and decoupling same from said battery in said high speed position of said switch means, said circuit means including a time-delay network delaying the energization of said motor by said circuit means for a predetermined time period subsequent to the operation of said switch means at said high speed position.

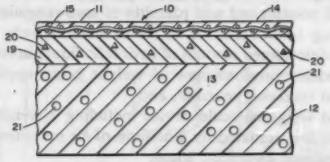
4,056,161

SOUND ATTENUATION MATERIAL

Ralph W. Allen, Jr., Melrose, Mass., assignor to Tillotson Corporation, Needham, Mass.

Filed Oct. 30, 1975, Ser. No. 627,278
Int. Cl.[2] G10K *11/04*
U.S. Cl. 181—290 **3 Claims**

1. A sound attenuating material comprising a polyvinyl chloride wear resistant outer layer containing embedded fiber reinforcement, a sound absorption layer comprising a foam material, and a sound barrier layer interposed between said outer and sound absorption layers, said barrier layers comprising a polyvinyl chloride layer containing a particulate, high density filler in major proportion by weight based upon the weight of the polyvinyl chloride, said sound barrier layer also serving as a bonding layer laminating said outer and said sound



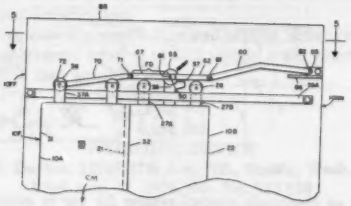
absorption layers together, said sound attenuating material being operable to absorb vibration and to inhibit transmission thereof.

4,056,162

OPERATING MECHANISM FOR OVERLAPPING PANELS TYPE DOORWAY CLOSURES

Richard L. Brown, Bellevue, Nebr., assignor to Lo-Rise Elevator Company, Plattsmouth, Nebr.

Filed Feb. 7, 1977, Ser. No. 766,266
Int. Cl.[2] B66B *13/08*
U.S. Cl. 187—52 R **9 Claims**



1. Operating mechanism for doorway closures of the rollably suspended overlapping parallel panels type, said doorway opening framework stationarily comprising an upright near-jamb at a finite lateral-extent from an upright far-jamb and a horizontal floor and header, there being a pair of horizontal overhead parallel rails attached to the framework nearer said header than to the floor and laterally extending in excess said lateral-extent including a front-rail forwardly offset a transverse-gap of a rear-rail, the doorway closure panels above mid-height being rollably suspended from the respective rails, said closure panels including a faster moving far-panel having a finite lateral-width representing a ratio compared to doorway lateral-extent within the range of one-third to two-thirds, said operating mechanism ensuring that the closure panels move appropriately interdependently between fully-open and fully-closed positions relative the doorway opening and comprising:
A. A transversely extending shaft turnable in both angular directions about its transverse-axis, said shaft being associated with the near-panel at a fixed elevation located above mid-height and hence also laterally co-movable with said near-panel;
B. A dual-arms lever including a first-arm and a secondarm at a fixed obtuse angular relationship and merging together at a turning-point, said lever arms being co-turnably attached to the transverse shaft, said dual-arms lever and shaft being sufficiently remote of the far-panel as to not abut thereagainst during far-panel lateral movement;
C. Dual-directional powering means for turning the shaft in both angular directions about its transverse-axis;
D. A far-link having its far-end pivotably attached to the far-panel at fixed elevation located above the far-panel mid-height, said far-link near-end being pivotably at-

tached to the lever second-arm a finite-distance from the shaft transverse-axis;

E. A near-link having its far-end pivotably attached to the first-arm and having its near-end pivotably attached at an immovable-location which is nearwardly laterally offset the doorway near-edge; and

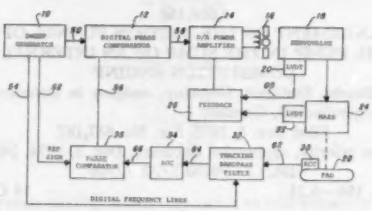
F. Stop means to limit turning of the shaft in both angular directions as the interdependently laterally movable panels approach fully-open and fully-closed positions at said framework jambs.

4,056,163

TRACKING BANDPASS FILTER FOR CONDITIONING VIBRATOR ACCELEROMETER WAVEFORM

George William Wood, Dallas, and John James Sallas, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 1, 1975, Ser. No. 573,498
Int. Cl.² G01V *1/02*
U.S. Cl. 181—113 **18 Claims**



1. A control system for a vibratory seismic source comprising:

a. means for generating a first variable frequency electrical signal representative of the desired motion of said seismic source,

b. means for generating a second electrical signal representative of the actual motion of said seismic source,

c. tracking bandpass filter means responsive to said second electrical signal, the frequency response of said tracking bandpass filter means being variable to maintain a local amplitude response peak at the instantaneous frequency of said first electrical signal; and

d. phase comparator means responsive to said first electrical signal and to the signal produced by said tracking bandpass filter means to generate an error signal for controlling said seismic source.

4,056,164

STABILIZED PORTABLE SEISMIC SIGNAL TRANSDUCER

Otis A. Johnston, League City, Tex., assignor to Western Geophysical Co., Houston, Tex.

Filed July 21, 1976, Ser. No. 707,178
Int. Cl.² G01V *1/04, 1/14*
U.S. Cl. 181—114 **17 Claims**

5. A portable seismic signal source apparatus, comprising:

a seismic energy source;

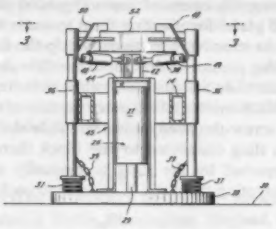
a base plate;

said source being coupled to said base plate and adapted to impart seismic energy to the ground through said base plate;

a vehicle having a frame;

means supported on said frame for raising and lowering said base plate and for exerting a substantial portion of the weight of said vehicle on said base plate while said base plate is imparting seismic energy from said source to the ground;

at least one hydraulic damper connected between said frame and said source; and



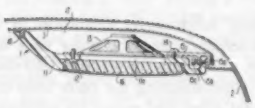
means for releasably biasing said damper to resist a lateral rotational motion of the vertical axis of said source without restricting the axial movement therealong.

4,056,165

SOUND REPRODUCING APPARATUS IN THE INSIDE OF A CAR

Kintaro Okamoto, Hachioji; Hirokatu Kudo, Wako; Soichi Ishijimi, Tokyo; Etsuro Kadoiri, Tokyo; Hiroshi Soma, Tokyo, and Hiroyuki Suzuki, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Pioneer Electronic Corporation, both of Tokyo, Japan

Filed Oct. 28, 1975, Ser. No. 626,005
Claims priority, application Japan, Oct. 28, 1974, 49-124055; Oct. 28, 1974, 49-130149; Oct. 28, 1974, 49-103150
Int. Cl.² H05K *10/00*
U.S. Cl. 181—141 **4 Claims**



1. A sound reproducing apparatus in the inside of a car comprising speaker assemblies located in boundary portions between inside panels forming a part of the side wall of the inside of the car and ceiling material extending to the upper end of said inside panels, each of said speaker assemblies comprising a speaker unit fixed to a baffle plate, and a fixture attaching said speaker unit and said baffle plate to the upper end of said inside panel so as to form back chambers of predetermined capacity between said baffle and the ceiling of said car, said fixture having a first bent portion that rests on the back of the upper end of said inside panel and a second bent portion, and a bolt fastening the upper end of said inside panel between said first and second bent portions.

4,056,166

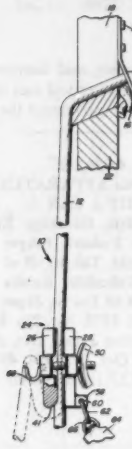
DETACHABLE FIRE ESCAPE DEVICE

Nicholas A. Rabelos, 7 Armour Lane, Riverdale, Ga. 30296, assignor to Thomas G. Clark; Kenneth B. Clary; J. Melvin England; Charles O'Brien, Jr. and Nicholas A. Rabelos, all of Atlanta, Ga.

Filed July 28, 1976, Ser. No. 709,296
Int. Cl.² A62B *1/14*
U.S. Cl. 182—5 **3 Claims**

1. A fire escape device comprising an elongated flexible member having an upper end capable of being anchored with respect to a building structure and having a length to depend to adjacent ground level or other safe level, a slide and sling assembly detachably mounted on the flexible member for longitudinal movement therealong, said slide and sling assem-

bly including a slide in the form of a pair of hingedly connected plates provided with facing grooves receiving the flexible member, manually operated screw-threaded means interconnecting said plates for pivoting them towards and away from each other to selectively frictionally grip the flexible member for controlling the rate of descent of the slide along the flexible member, said slide and sling assembly including a projecting mounting block on the lower outer portion of the outer plate below said screw-threaded means, said slide and sling assembly including a sling connected to said block thereby enabling a person supported by the sling to manually manipulate the means for pivoting the plates in relation to each other, each of



said plates being substantially cruciform in configuration, hinge means interconnecting the outer ends of one pair of horizontal arms, said means for pivoting said plates in relation to each other interconnecting the outer ends of the opposite pair of horizontal arms, said means for pivoting the plates in relation to each other including a threaded rod hingedly attached to a horizontal arm on one of said plates and a wing nut threaded onto said threaded rod and engaged with the arm on the other of said plates, said wing nut being disposed outwardly of the plate having the mounting block thereon whereby a person supported from the sling connected to the mounting block will have access to the wing nut.

4,056,167

EMERGENCY ELEVATOR

Raymond Bonnfos, Ris Orangis, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

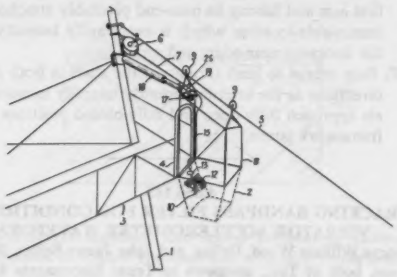
Filed July 20, 1976, Ser. No. 707,053

Claims priority, application France, July 23, 1975, 75.23001

Int. Cl.[2] A62B *1/02*

U.S. Cl. 182—10 **4 Claims**

1. Apparatus for automatically escaping from a tall structure, said apparatus comprising a chamber formed by a light metal frame and a flame-resistant cloth pocket suspended from said frame, said chamber being mounted to travel on a cable attached at one end to said structure, and an automatically releasable latching system attached to said cloth pocket and adapted to connect said chamber to said structure when the chamber is empty but initiate the release and descent of the



chamber upon the application of tension to said cloth when a person jumps into the chamber.

4,056,168

ARRANGEMENT OF THE SUCTION FUNNEL OF AN OIL PUMP IN THE SUMP OF AN INTERNAL COMBUSTION ENGINE

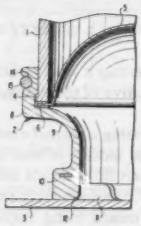
Alfred Bajohr, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 3, 1975, Ser. No. 637,187

Claims priority, application Germany, Dec. 5, 1974, 2457508

Int. Cl.[2] F01M *1/10, 11/06*

U.S. Cl. 184—6.24 **14 Claims**



1. An arrangement of a suction funnel of a lubricating oil pump in an oil pan of an internal combustion engine, in which the suction funnel is supported at the bottom of the oil pan by means of an elastic hollow spacer means and the interior space of the suction funnel is sealingly connected with the interior space of the hollow spacer means, the spacer means resting with its lower end on the bottom of the oil pan by way of a support rim means provided with at least one opening determining the air-free suctioning-off, characterized in that the spacer means directly surrounds the inlet end of the suction funnel by a portion of the spacer means located in the upper half thereof, said portion having a larger diameter than a lower half portion, and a screen filter being arranged in the suction funnel and being force-lockingly and form-lockingly clamped in by a retaining rim clamped between the suction funnel and the portion of the spacer means surrounding said suction funnel.

4,056,169

ELEVATOR CONTROL SYSTEM

John Melville Showalter, Clark, N.J., assignor to United Technologies Corporation, Hartford, Conn.

Filed June 28, 1976, Ser. No. 700,630

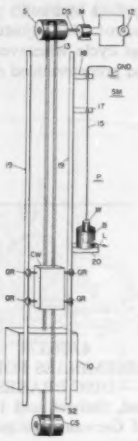
Int. Cl.[2] B66B *5/02*

U.S. Cl. 187—29 R **18 Claims**

1. An elevator control system for use in a building which

occasionally experiences vibratory motion caused by wind, said elevator control system including a drive motor for moving an elevator through a hostway in said building to any one of a plurality of landings at which it can be stopped and further comprising:

speed control means controlling said motor so that said car can move at a maximum velocity having a first predetermined magnitude;



vibration sensing means responsive to said vibratory motion and producing a vibration signal in response to said vibratory motion of a predetermined magnitude being sustained for a predetermined time interval; and

limit means operating in response to said vibration signal and controlling said speed control means to limit the maximum velocity at which said motor can move said car to a second predetermined magnitude which is less than said first predetermined magnitude.

4,056,170

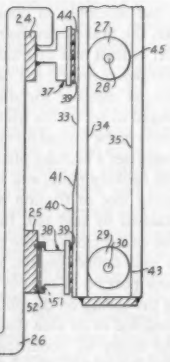
LOAD FORCE BYPASSING APPARATUS FOR LIFT TRUCK MASTS

Charles R. Chelin, Peoria, Ill., assignor to Towmotor Corporation, Mentor, Ohio

Filed Oct. 18, 1976, Ser. No. 733,645

Int. Cl.[2] B66B *7/02*; B66F *9/12*

U.S. Cl. 187—95 **8 Claims**



1. In a mast arrangement including a generally upright support, a work engaging assembly, a plurality of rollers movably mounting the assembly on said generally upright support, said rollers normally being subjected to load forces imparted against said assembly during normal load crowding operations, the improvement comprising;

load force bypassing means for maintaining said rollers substantially free of loading due to said load forces, said bypassing means being positioned between said assembly and said support in direct force transmitting relation therebetween to thereby directly pass said load forces from said assembly to said support only when said assembly is below a preselected height of said support.

4,056,171

LOW FRICTION SUPPORT FOR DISC BRAKE PAD

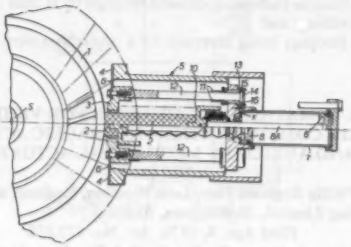
Colin John Frederick Tickle, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed June 8, 1976, Ser. No. 693,910

Claims priority, application United Kingdom, June 9, 1975, 24698/75

Int. Cl.[2] B60T *1/06*

U.S. Cl. 188—18 A **1 Claim**



1. A brake for braking a rotor having a braking surface, comprising an elongate body of friction material for braking engagement with said rotor surface; a support close to said rotor surface supporting said body of friction material; a fixed structure; connecting means connecting said support to said fixed structure; and means for urging said body of friction material into engagement with said rotor surface, wherein said connecting means comprises at least one flexible member which is relatively rigid in a first plane perpendicular to the direction of movement of said body of friction material and which is flexible in a plane perpendicular to said first plane, said flexible member comprising a plate including means defining an elongate slot which permits said flexing, said member being connected between said support and said fixed structure.

4,056,172

DISK BRAKE

Tullio Campagnolo, P.O. Box 822, Vicenza, Italy

Filed Aug. 13, 1976, Ser. No. 714,284

Claims priority, application Italy, Aug. 14, 1975, 26358/75

Int. Cl.[2] F16D *55/02*

U.S. Cl. 188—26 **2 Claims**

1. Disk brake for wheels of ground or air vehicles and especially motorcycles, comprising:

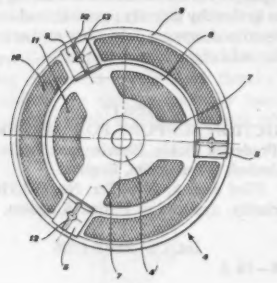
at least one brake disk connecting the actual hub of the wheel with the spokes-carrying flange of the wheel itself;

at least one non-rotating plate, provided with friction pads and slidable along the wheel axis in order to establish or remove the braking engagement between said friction pads and said disk, under the opposing action of fluid pressure control means and of spring return means;

the surface of the brake disk being a conical surface, with its axis coinciding with the wheel axis, and the friction pads being carried by the non-rotating plate in such a way as to lie on a conical surface mating with the conical surface of the disk, with which they are engageable;

wide slottings in the non-rotating plate, thereby to provide a

unit comprising a hub, three spokes and two peripheral crowns, and having the friction pads applied to said spokes between one crown and the other;
said unit being a metal casting;



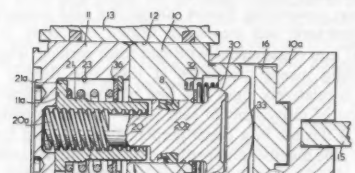
said friction pads being crossed through by at least one radial notching; and
said slottings being screened by a protective wire netting.

4,056,173

AUTOMATIC SLACK ADJUSTER FOR VEHICLE BRAKES COMBINED WITH A HYDRAULIC ACTUATOR AND AUXILIARY MECHANICAL ACTUATOR ASSEMBLY

Glyn Phillip Reginald Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Filed Apr. 5, 1976, Ser. No. 673,858
Claims priority, application United Kingdom, Apr. 8, 1975, 14269/75
Int. Cl.² F16D *65/56*
U.S. Cl. 188—71.9 **30 Claims**



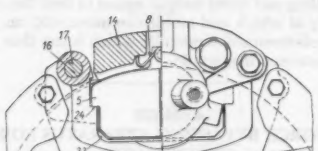
1. In combination with a hydraulic actuator for a vehicle brake comprising opposed first and second non-rotatable but relatively axially displaceable components which are movable apart by the application of hydraulic pressure therebetween; an auxiliary mechanical actuator fitted to said first component; an automatic slack adjuster operative between said auxiliary mechanical actuator and said second component for taking up increased slack due to lining wear, said slack adjuster including rotatable and non-rotatable adjuster elements of which the rotatable element has a screw-threaded portion and a further portion non-rotatable relatively thereto and a screw-thread connection between said screw-threaded portion and said non-rotatable adjuster element; means slidably sealing said further portion to said first hydraulic actuator component, such that the hydraulic pressure acts on said further portion of said rotatable adjuster element in the same direction as it acts on said first hydraulic actuator component, said auxiliary mechanical actuator acting on said second hydraulic actuator component via said rotatable adjuster element, said screw-threaded engagement and said non-rotatable adjuster element in that order; and spring means arranged to bias said further portion of said rotatable adjuster element in a direction opposite to the direction in which the applied hydraulic pressure acts thereon for producing at least part of an adjustment cycle when lining wear has taken place and when the applied hydraulic pressure is below a predetermined relatively low value, said adjustment cycle at least in part consisting of rotation of said rotatable adjuster element in a direction to take up increased slack due to the lining wear, said spring means being overcome by the applied hydraulic pressure acting on said further portion of said rotatable adjuster element to inhibit any part of an adjustment cycle whenever the applied hydraulic pressure is above said predetermined relatively low value.

4,056,174

FRICTION PAD ASSEMBLIES FOR SLIDING CALIPER DISC BRAKES

Hans-Jürgen Wienand, Steimel, and Horst Willi Klassen, St. Sebastian, both of Germany, assignors to Girling Limited, Birmingham, England

Filed Dec. 23, 1975, Ser. No. 643,827
Claims priority, application United Kingdom, Dec. 24, 1974, 55727/74
Int. Cl.² F16D *65/00*
U.S. Cl. 188—73.5 **9 Claims**



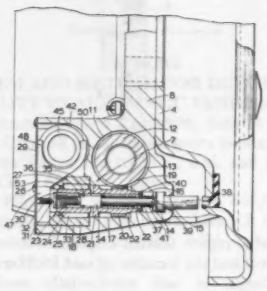
1. A friction pad assembly in combination with a sliding caliper disc brake, the brake comprising a torque member and a caliper member, at least one hydraulic actuator being incorporated in the caliper member, the caliper member being attached to the torque member for sliding movement relative thereto and arranged to act on the friction pad assembly which is located in a recess in the torque member, wherein the friction pad assembly comprises a backing plate, a pad of friction material secured to the backing plate, and a wire spring, a tab of the backing plate being free of friction material and a pin being permanently attached to said tab, the wire spring having a coiled region, the end regions of the spring protruding in two directions from said coiled region, the coiled region being fitted over a shank portion of the pin and a headed portion of the pin retaining the spring on the pin, the whole of the spring and pin being confined to an area that is not swept by the disc of the disc brake under all conditions of pad wear, the end regions of the spring engaging the undersurface of a portion of the caliper member, and the friction pad assembly engaging guides in the torque member so that the spring acts to urge the pad assembly against the guides, and to urge the caliper member away from the pad assembly.

4,056,175

SLACK ADJUSTERS FOR THE SHOES OF VEHICLE SHOE DRUM BRAKES OF THE DUO SERVO TYPE

Charles Newstead, Walsall; Andrew Charles Assinder, Redditch, and Geoffrey Harvey, Birmingham, all of England, assignors to Girling Limited, Birmingham, England

Filed Sept. 15, 1976, Ser. No. 723,657
Claims priority, application United Kingdom, Sept. 30, 1975, 39903/75
Int. Cl.[2] F16D 65/56
U.S. Cl. 188—196 BA 9 Claims



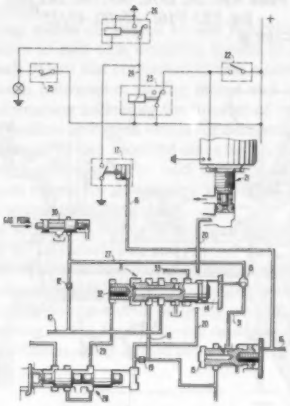
1. A vehicle internal shoe drum brake comprising a rotatable drum, primary and secondary shoes located within said drum, said primary shoe being carried around with said drum with a servo-action when the brake is applied, and automatic slack adjustment means being located between adjacent ends of said shoes, wherein said automatic slack adjusting means comprises a housing, a thrust member slidably guided in said housing and having an adjustable effective length, two tappets slidable in said housing and protruding from opposite ends thereof for engagement by ends of said shoes so that the thrust on said primary shoe when the brake is applied is transmitted to said secondary shoe to augment the brake applying force applied to said secondary shoe, said thrust member having threaded engagements of opposite hands at its opposite ends with said tappets, sensing means for sensing movement of said shoes when the brake is applied, and adjuster means incorporated in said housing for automatically increasing the effective length of said thrust member to compensate for wear of friction linings carried by said shoes when the said movement exceeds a predetermined amount, said sensing means comprising a helically toothed pinion forming a part of said adjuster means, said thrust member comprising a body provided with helical gear teeth meshing with said teeth on said toothed pinion such that said pinion moves in response to sliding movement of said thrust member, at least beyond a given amount, during application of the brake, and energy-storing clutch means controlled by said sensing means located within said housing and connected to said adjuster means to operate said adjuster means to increase the effective length of said thrust member when the torque generated on said thrust member by stored energy force exceeds the torque generated by the force applied to said thrust member from said shoe ends, said energy-storing clutch means acting on said pinion so as to effect adjustment of the length of said thrust member, said energy-storing clutch means comprising energy-storing means, a one-way clutch connected to said energy-storing means, said one-way clutch being connected to said pinion, and lost motion being incorporated in the connection from said clutch through said pinion to said thrust member.

4,056,176

DRIVE ARRANGEMENT FOR MOTOR VEHICLES, ESPECIALLY FOR PASSENGER MOTOR VEHICLES, WITH AN AUTOMATIC CHANGE-SPEED TRANSMISSION

Hans-Joachim M. Förster, and Hermann Gaus, both of Stuttgart, Germany, assignors to Daimler-Benz Aktiengesellschaft, Japan

Filed May 3, 1976, Ser. No. 682,213
Claims priority, application Germany, May 3, 1975, 2519903
Int. Cl.[2] B60K 41/26
U.S. Cl. 192—4 A 8 Claims



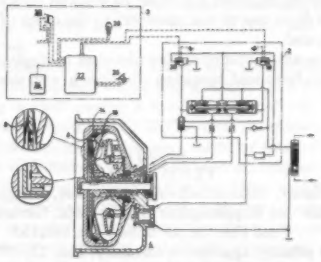
8. A drive arrangement for motor vehicles, including an automatically shifting transmission means, a warm-up control means for raising an idling rotational speed of the driving engine during a warm-up phase, and brake means for braking the vehicle, characterized by means for shifting the transmission means from first to second speed upon an actuation of the brake means during the warm-up phase of the engine while the idling rotational speed is artificially raised by said control means.

4,056,177

SIMPLIFIED ELECTRONIC PILOT AND REMOTE CONTROL SYSTEM FOR 1½ STAGE TRANSMISSION

Karl Gustav Ahlen, and Gunnar Wahlsten, both of Stockholm, Sweden, assignors to S.R.M. Hydromekanik Aktiebolag, Sweden

Filed May 7, 1976, Ser. No. 684,318
Int. Cl.[2] F16D 47/06
U.S. Cl. 192—.032 7 Claims



1. A control system for connecting and disconnecting the lock-up clutch in a hydrodynamic torque converter for a prime

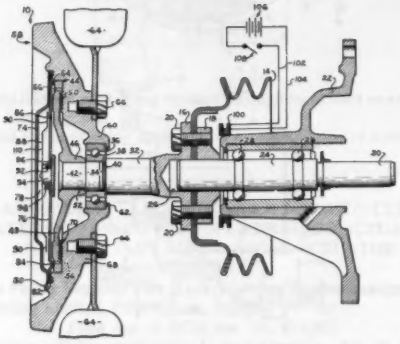
mover, comprising first means for deriving a signal representative of the input speed of the prime mover, second means for deriving a signal representative of the torque setting of the prime mover, and means for comparing the signals and for controlling the setting of the clutch in accordance with that comparison.

4,056,178

MAGNETICALLY ACTUATED VISCOUS FLUID COUPLING

Rodney H. Detty, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 28, 1976, Ser. No. 681,106
Int. Cl.[2] F16D *35/00, 43/25*
U.S. Cl. 192—58 B **18 Claims**



1. A viscous fluid clutch comprising
a shaft made of magnetic material;
a first member secured to said shaft;
a second member rotatably disposed on said shaft relative to said first member;
shear surfaces disposed on said first and second members and forming an operating chamber therebetween;
a fluid storage chamber adjacent said operating chamber;
means for selectively inducing a magnetic field in said shaft;
valve means effecting selective communication between said storage chamber and said operating chamber and including a valve member, including an armature made of a magnetic material and located adjacent said shaft, movable in response to the induction of said magnetic field in said shaft from a first position to a second position, one of said positions providing communication between said storage chamber and said operating chamber and the other of said positions blocking such communication;
fluid means disposed within said storage chamber and being selectively displaced into said operating chamber when said valve member is in said one position to provide in said operating chamber a medium to transmit rotational movement from one of said members to the other of said members; and
pump means in said operating chamber to displace said fluid means from said operating chamber to said storage chamber.

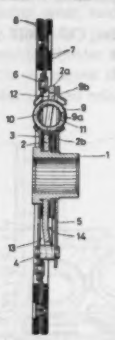
4,056,179

CLUTCH DISK

Lothar Huber, Buhl-Altschweier, Germany, assignor to LuK Lamellen und Kupplungsbau GmbH, Buhl, Germany

Filed Feb. 23, 1976, Ser. No. 660,155
Claims priority, application Germany, Feb. 22, 1975, 2507725
Int. Cl.[2] F16D *3/66*
U.S. Cl. 192—106.2 **1 Claim**

1. Clutch disk assembly, comprising a hub member, a flange carried by said hub member, respective disks mounted on said hub member at opposite sides of said flange, force storage means engageable with said flange and said disks so as to afford rotational play of said disks relative to said flange in a direction opposite the biasing action direction of said force storage means, and at least one friction device disposed between and effective upon said relatively rotatable flange and disks, said flange being dish-shaped and having a substantially conical



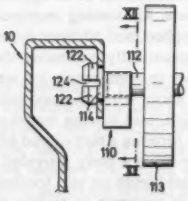
portion in a radial region thereof disposed between the outer periphery thereof and the location of said friction devices, said dish-shaped flange, in said substantially conical portion thereof, being formed with at least one cut-out wherein said force storage means are received, said force storage means being engageable with abutment contours defining said cut-out, said abutment contours extending substantially centrally through the axis of said force storage means.

4,056,180

SET OF COMPONENTS FOR PRODUCING VARIABLE LOAD-BEARING SCAFFOLDS

Rolf Gunti, Laufen, Switzerland, assignor to Masyc AG, Laufen, Switzerland

Filed Aug. 27, 1975, Ser. No. 608,399
Claims priority, application Switzerland, Aug. 27, 1974, 11677/74
Int. Cl.[2] B65G *39/02*
U.S. Cl. 193—35 J **2 Claims**



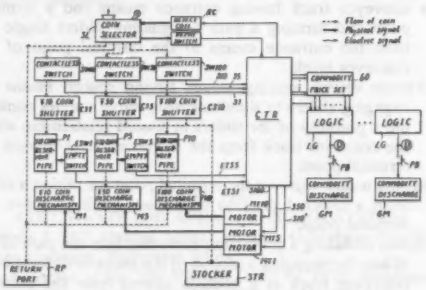
1. A set of components for producing load-bearing scaffolds comprising profile bars each of which has an approximately Σ-shaped cross-section with a flat centre web section and two equally dimensioned flanges arranged in mirror image relationship, each of said centre web section and an inwardly angled free arm of each flange, which arm extends parallel to the centre web section, being provided with perforations; connecting bars each of which has cross-section which is geometrically approximately similar to that of the profile bars with a centre web section and two equally dimensioned flanges arranged in mirror image relationship and has such dimensions that a one of said connecting bars is slidably insertible into a one of said profile bars with engaging and fitting flanges and mutually superposed centre web sections, the centre web section of each of the connecting bars being provided with perfo-

rations, said profile and connecting bars being mutually detachably connectable by connecting means located through mutually superposed perforations; and reducing elements which are provided for supporting the axles of small rollers or light support rollers, the reducing elements being each located in a perforation of the profile bars and each having a fixing stud insertible releasably and engageably into a perforation of a one of the profile bars and each having a bearing ring for receiving an end of one of said axles, each said reducing element having a bearing plate which is H-shaped in plan and has two triquadrant-shaped bearing section rings and wherein the fixing stud is arranged laterally staggered above a one of the two bearing section rings and has an external circumference insertible as a snug fit into a polygonal perforation in a one of said profile bars.

4,056,181
SYSTEM AND METHOD FOR DETERMINING VENDIBILITY IN AUTOMATIC VENDING MACHINE

Shigehiko Ikeguchi; Norio Yamashita, both of Oora, and Eiji Matsuda, Oota, all of Japan, assignors to Sanyo Electric Co., Ltd.; Tokyo Sanyo Electric Co., Ltd. and Sanyo Vending Machine Co., Ltd., all of, Japan

Filed Mar. 16, 1976, Ser. No. 667,543
Claims priority, application Japan, Mar. 17, 1975, 50-32579
Int. Cl.² G07F 9/04
U.S. Cl. 194—10 **15 Claims**



1. A system for determining vendibility in an automatic vending machine, comprising:

means for receiving a plurality of kinds of coins, said plurality of kinds of received coins comprising at least three kinds of coins of large, medium and small values, said large and medium values being as large as integral times said small value,

means coupled to said coin receiving means for sorting said received coins depending on said kinds of coins,

means coupled to said coin sorting means for detecting each of said received and sorted coins separately for each kind of coins, and for generating a small, medium and large value coin detecting signal upon detection of said coins of small, medium and large value, respectively,

means coupled to said coin sorting means for reserving received and sorted coins separately for each kind of coins,

means coupled to said coin reserving means for detecting when said reserved coins are fewer than a predetermined number of coins separately for each kind of coins,

means coupled to said coin reserving means for discharging said reserved coins as change from said coin reserving means,

means coupled to said detecting means and responsive to said medium value coin detecting signal for storing information indicating the number of received coins of said medium value,

means coupled to said detecting means and responsive to said small value coin detecting signal for storing information indicating the number of received coins of said small value,

means coupled to said detecting means and responsive to said small, medium and large value coin detecting signals for generating information indicating the total amount of received coins,

means operatively associated with said small value coin information storing means for generating unit information proportional to said small value coin information,

subtraction means responsive to said total amount information generating means and said small value unit information generating means for effecting sequential subtraction of said small value unit information from said total amount information,

determining means connected to said detecting means and responsive to said coin detecting signals of said medium and small values and connected to said medium and small value coin information storing means and responsive to said information indicating the number of received coins of said medium and small values for determining availability as change of said received coins for each stage of said sequential subtraction by said subtraction means, and having an output for designating vendibility at each stage of said sequential subtraction,

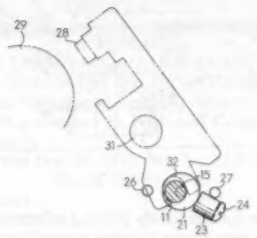
means for setting a plurality of prices of commodities being vended by said machines, and

display means connected to said determining means and responsive to said vendibility designating output from said determining means and operatively associated with said price setting means for displaying ones among said preset prices of commodities in said price setting means that are vendible.

4,056,182
STYLUS ACTUATOR

Ronald Kent Thuet, Salt Lake City, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 21, 1976, Ser. No. 678,850
Int. Cl.² B41J 25/00
U.S. Cl. 197—1 R **6 Claims**



1. A stylus actuator comprising in combination:

a stylus carriage having a print head at one end, said stylus carriage adapted to rotate between print and non-print positions;

a slot disposed in the other end of said stylus carriage;

shaft means disposed within said slot, said shaft means comprising a shaft having a first longitudinal axis, first and second extensions integrally formed at opposite ends of said shaft means and having a diameter smaller than that of said shaft means, said first and second extensions having a common longitudinal axis displaced from said first longitudinal axis of said shaft means, such that when said shaft means is rotated the axis of rotation is said common longitudinal axis of said first and second extensions, such that rotation of said shaft means in a first direction causes said stylus carriage to rotate to said print position and rotation of said shaft means in a second direction causes said stylus carriage to rotate to said non-print position;

bearing means for rotationally supporting said first extension;

motor means having a drive shaft connected to said second extension for rotating said shaft means;

spring means disposed on said shaft means normally biasing said shaft means to said non-print position whereby when said motor means is de-energized said shaft means is rotated to the non-print position;

a coupling disposed on said shaft means;

an extension extending radially outward from said coupling;

first stop means disposed in the path of said extension for limiting movement of said stylus carriage in said first direction and into said print position; and

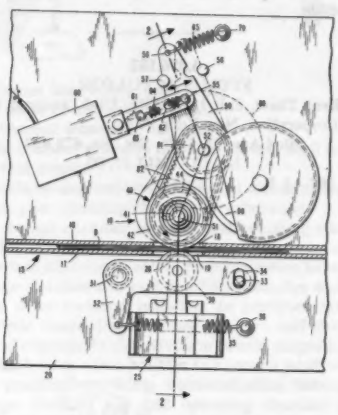
second stop means disposed in the path of said extension for limiting movement of said stylus carriage in said second direction and into said non-print position.

4,056,183

RIBBONLESS ENDORSER HAVING A SHIFTABLE INKED PLATEN AND FEED ROLLER

Jack Beery, Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 7, 1976, Ser. No. 684,449
Int. Cl.[2] B41J *7/10*
U.S. Cl. 197—1 R **16 Claims**



1. Apparatus for selectively printing information onto documents moving past a print location comprising:

a. selectively actuable impact producing means;

b. rotatable impact receiving means shiftable between a retracted position and an advanced print position;

c. means for shiftably supporting said impact receiving means;

d. means for controlling the speed of said documents moved past the print location including (1) feed roller means supported by said shiftable supporting means, and (2) pressure roller means cooperable with said feed roller means to pinch the documents therebetween when said impact receiving means is in the advanced print position, said feed roller means and said impact receiving means being mounted for conjoint rotation on said shiftable supporting means; and

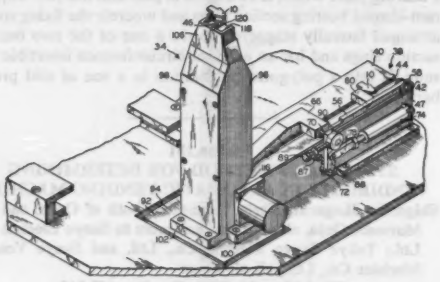
e. means for shifting said shiftable supporting means, to shift said impact receiving means and said feed roller means between said retracted position and said advanced print position.

4,056,184

APPARATUS AND METHOD OF POSITIONING SLIDERS

Richard R. Silvis, Meadville, and John A. Ettinger, Conneaut Lake, both of Pa., assignors to Textron Inc., Providence, R.I.

Division of Ser. No. 484,906, July 1, 1974, Pat. No. 3,964,615.
This application Feb. 23, 1976, Ser. No. 660,610
Int. Cl.[2] B65G *37/00*
U.S. Cl. 198—471 **6 Claims**



1. An apparatus for positioning a slider in a slider assembly station, comprising

support means defining a work area,

a conveyor track having entrance means and a terminal point and forming a path for guiding sliders single file from the entrance means to the terminal point of the conveyor track,

friction driven moving means having spaced means for engaging sliders to simultaneously move a series containing a plurality of the sliders in spaced relationship along the conveyor track from the entrance means toward the terminal point,

raising means adjacent the terminal point for raising a slider from a lowered position to a raised position above the terminal point,

means including a projection extending into the path of the sliders for engaging a second of the series of sliders on the conveyor track at a position spaced from the terminal point to stop the moving means to prevent pile-up at the terminal point,

transfer means for transferring the first slider from the terminal point of the conveyor track to the raising means in a lowered position, and

means responsive to operation of the transfer means for releasing the projection to allow the series of sliders to advance along the conveyor track.

4,056,185

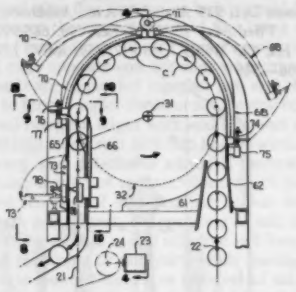
CONVEYOR UNLOADER

William J. Cartwright, Palos Park, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 21, 1973, Ser. No. 390,241
Int. Cl.[2] B65G *47/00*
U.S. Cl. 198—484 **13 Claims**

1. An apparatus for unloading cans and like tubular members from travelling supports carried by an endless conveyor, said apparatus comprising a turret mounted for rotation about an axis, a plurality of carriers having means defining pockets, means mounting said carriers in uniformly circumferentially spaced relation about said axis for rotation in unison about said axis and independent reciprocation parallel to said axis, the spacing of said carriers corresponding to the spacing of travelling supports from which cans and like tubular members are to be unloaded, means for rotating said turret with said carriers moving at the same rate as the supports, said carriers defining radially outwardly opening pockets, outer guide means disposed generally radially outwardly of said carriers and cooperable with said carriers to retain cans and like tubular members

within said pockets, and each carrier including a stripper member for engaging a can or like tubular member at one end thereof to move the same axially with said carrier, said turret being encased within an enclosure including swingably mounted doors, said outer guide means being at least in part



carried by said doors, and door support means for adjustably positioning said doors relative to said axis to selectively vary the spacing between said outer guide means and said carrier pockets for receiving cans and like tubular members of selected different diameters.

4,056,186

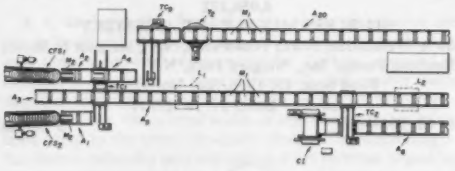
COIL HANDLING APPARATUS AND SYSTEM

William J. Hill, Holden, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Continuation of Ser. No. 570,236, April 21, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 771,058

Int. Cl.² B23Q 5/22

U.S. Cl. 198—339 **10 Claims**



1. An apparatus for transporting upstanding cylindrical product coils between stations employing coil transfer mandrels, said apparatus comprising: a plurality of separately driven roller table modules aligned to form longitudinally extending roller conveyor avenues, the roller table modules adjacent to said stations having laterally arranged rollers defining first open ended spaced therebetween; pallets having base sections with laterally spaced leg members defining second open ended spaces therebetween, said second open ended spaced being arranged for vertical alignment with said first open ended spaces to accept the coil transfer mandrels when said pallets are located adjacent to said stations, support members extending upwardly from said leg members to provide lateral support for coils deposited thereon, said base sections being adapted for movement on said roller table modules along said roller conveyor avenues; and, transfer means for laterally shifting certain of said roller table modules from one to another of said roller conveyor avenues.

4,056,187

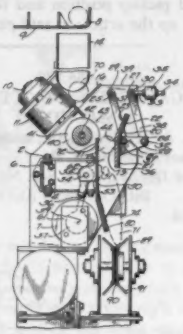
CORN ORIENTING MACHINERY

Fortunato S. Ajero, South Milwaukee, Wis., assignor to Carlo S. Ajero, South Milwaukee, Wis.

Filed Sept. 30, 1976, Ser. No. 728,351

Int. Cl.² B65G 47/24

U.S. Cl. 198—394 **17 Claims**



15. A tapered object orienting machine adapted to orient tapered objects with their smaller ends foremost, of the type having first and second inwardly opposed orienting surfaces biased toward each other, between which surfaces a tapered object is engaged on opposite edges of its largest diametral plane in an orienting operation, wherein the improvement comprises an orienting lane of fixed length bounded by said opposed orienting surfaces, having a first fixed point where an object to be oriented is engaged at the edges of its largest diametral plane and a second fixed point where such engagement is released at the end of the orienting operation, said first and second fixed points being constant when tapered objects having different largest diameters are oriented in said machine, and means to intermittently apply an upward force to objects in said lane whereby to orient said objects without overcorrection.

4,056,188

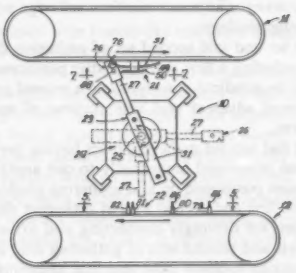
CONVEYOR TRANSFER APPARATUS PICKUP MEANS REACH-RETRACT CONTROL

Thomas R. MacFarlane, and Frank R. Skinner, II, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 24, 1975, Ser. No. 625,520

Int. Cl.² B65G 47/00

U.S. Cl. 198—465 **11 Claims**



1. Apparatus for transferring an article from a conveyor wherein the article is moved along a preselected path, said apparatus comprising: means for sensing the presence of an article carried by the first conveyor at a pickup position; a carrier; a pickup device mounted on the carrier; means for

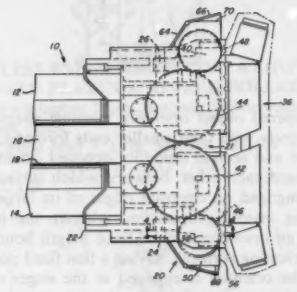
translating the carrier to move the pickup device to said pickup position for picking up the article thereat, and subsequently from said pickup position to a delivery position; and means for incrementally adjusting the position of the pickup device on the carrier while the carrier is being translated at said pickup position to cause the pickup device to move seriatim inwardly and outwardly transversely to said path to substantially follow said path at said pickup position and thereby be effectively disposed to pick up the article at said pickup position.

4,056,189

MATERIAL GATHERING DEVICE FOR A MINING MACHINE

Donald L. Freed, Jr., Belleville, Ill., assignor to National Mine Service Company, Pittsburgh, Pa.

Filed Dec. 23, 1975, Ser. No. 643,856
Int. Cl.[2] B65G *65/06*
U.S. Cl. 198—514 **9 Claims**



1. A material gathering device for a mining machine comprising,

a gathering platform extending forwardly from the mining machine,

said gathering platform having a transverse forward edge portion and side portions extending rearwardly therefrom,

a longitudinal conveyor extending rearwardly from said gathering platform,

said conveyor being operable to convey dislodged material rearwardly from said gathering platform on the mining machine,

a first set of gathering disc members rotatably positioned in side by side relation on one side of said longitudinal conveyor adjacent said forward edge portion of said gathering platform,

a second set of gathering disc members rotatably positioned in side by side relation on the opposite side of said longitudinal conveyor adjacent said forward edge portion of said gathering platform,

said first set and said second set of gathering disc members each including a first gathering disc positioned oppositely of said longitudinal conveyor and a second gathering disc positioned adjacent said side portion of said gathering platform,

said first and second gathering discs having peripheral edge portions positioned tangentially to one another,

drive means positioned on said gathering platform for rotating said first and second sets of gathering disc members,

gear means for drivingly connecting said drive means with said first and second sets of gathering disc members and transmitting rotation from said first gathering disc to said second gathering disc,

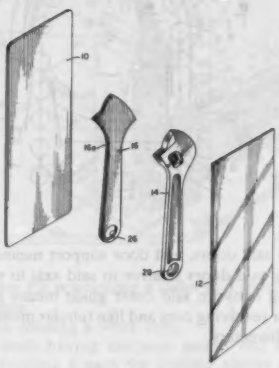
said gear means secured to said peripheral edge portions of said first and second gathering discs so that said gear means of said gathering discs are maintained in meshing relation and said gathering disc members of each of said sets rotate in opposite directions to convey dislodged material laterally from said gathering platform onto said longitudinal conveyor.

4,056,190

PACKAGING ARTICLES AND IDENTIFYING TEMPLATES

Walter James Dix, 919 Avondale Ave., Asheboro, N.C. 27203

Filed May 13, 1976, Ser. No. 685,992
Int. Cl.[2] B65D *75/36, 75/54;* A45C *11/26*
U.S. Cl. 206—349 **2 Claims**



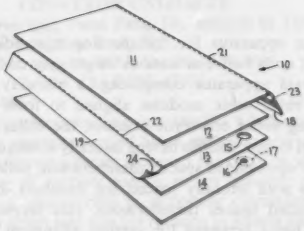
1. A package for an article comprising a backing member having a mounting surface and an encasing element, said encasing element when received on and adhered to said backing member conforming substantially to the outline of said article thereby to support said article adjacent said backing member, and wherein the improvement comprises a template, said template formed by a sheet material body having a silhouette forming a representation of the outline of said article, said template body including means by which it may be supportingly received on a display surface to identify the placement of said article, and said template body being received in said package juxtaposed said mounting surface of said backing member and below said article and encasing element.

4,056,191

STUBLESS MULTI-PART ASSEMBLY

John A. Weisenfluh, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Sept. 15, 1976, Ser. No. 723,247
Int. Cl.[2] B65D *27/14, 27/34*
U.S. Cl. 206—629 **5 Claims**



1. A multi-part mailer construction, comprising superimposed first, second, third and fourth parts, said third part having at least one first hole therein of a predetermined first size along one of its margins, a quantity of detachable adhesive extending between said second and fourth parts and through said hole of said third part for securing said second and fourth parts together, said adhesive extending through said first hole

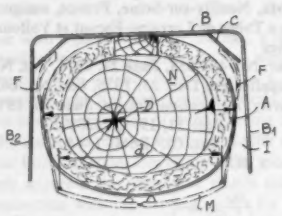
having a cross-sectional size which is less than said predetermined size of said first hole so as to be spaced inwardly of the marginal edge of said first hole for retaining said third part in place, said first part having a first glue flap thereon underlying said fourth part and being secured thereto, said first flap being removably secured to said first part along a line of weakening located at one marginal edge thereof, and said second part having a second glue flap thereon underlying said fourth part and being secured thereto, said second flap being removably secured to said second part along a line of weakening located at a marginal edge opposite said one edge whereby said second and fourth parts are connected together and said third part is immobilized to form a mailer construction having open sides at other than said marginal edges with said first part detachably connected thereto along said first flap line of weakening, said one flap having said detachable adhesive thereon, and said parts each being devoid of any tear lines which may form a stub, whereby removal of said first part leaves said second, third and fourth parts intact, or separation of said second and fourth parts effects a break in said adhesive and frees said third part from the remaining of said parts while leaving said first and fourth parts interconnected, or removal of said first part together with separation of said second and fourth parts separates each of said parts from one another.

4,056,192

DISPLAY DEVICE FOR SPECTACLES

Marcelle Barrois, Garches, France, assignor to Techniform, Nanterre, France

Filed July 15, 1976, Ser. No. 705,551
Int. Cl.[2] A47F 7/02
U.S. Cl. 211—13 **5 Claims**



1. A display device for spectacles, comprising a core member to be straddled by the frames of spectacles to be displayed, said core member having, normally convex, opposed side surfaces and including a layer of inwardly deformable material disposed thereon for contact with the respective side-pieces of said spectacles, the normal width of said core member being at least equal to the centre-to-centre distance between hinges of the frames, whereby said side-pieces form furrows in said layer when mounted on said core member, and forcing means situated for engagement with the free ends of the side-pieces to urge said free ends toward each other when the spectacles are so mounted.

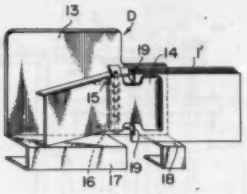
4,056,193

SHEET HOLDER ATTACHMENT ADAPTED TO BE USED WITH SHEET HOLDER FOR SHEET COUNTER

Minoru Yoshida, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1976, Ser. No. 670,843
Claims priority, application Japan, Mar. 28, 1975, 50-41722
Int. Cl.[2] B65H 5/08
U.S. Cl. 211—51 **1 Claim**

1. In combination with a sheet holder for a sheet counter for counting sheets by suction attracting them one by one, a small sheet holder attachment, said sheet holder including a sheet receiving plate, a sheet holding plate attached thereto, a counted sheet keeper rod, means pivotally mounting the sheet holding plate and the sheet receiving plate for movement toward the sheet keeper rod to a sheet counting position, said small sheet holder attachment characterized by: a base member, means mounting said base member to the sheet holding plate of the sheet holder for movement with the sheet holding plate toward the keeper rod, a keep member pivotably



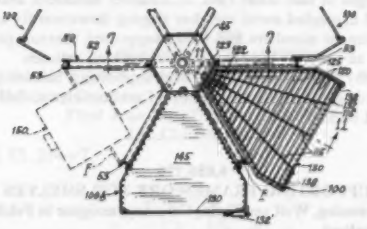
mounted on said base member and spring means for urging said keep member toward said base member to clamp a stack of small sheets to be counted between said base member and said keep member, said base member having a stand portion for supporting the lower end of the sheet stack, and abutment members adapted to engage the rear end of the sheet stack.

4,056,194

COMBINATION SERVICE TRUCK AND DISPENSING EQUIPMENT

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.

Division of Ser. No. 418,835, Nov. 26, 1973, Pat. No. 3,957,159, which is a division of Ser. No. 240,163, March 31, 1972, Pat. No. 3,807,788. This application Nov. 17, 1975, Ser. No. 632,625
Int. Cl.[2] A47F 3/14, 5/14
U.S. Cl. 211—131 **4 Claims**



1. A reticulated wire basket-like container designed to hold a plurality of loose articles, comprising

a. a bottom portion of crossed wires with an element extending rearwardly beyond the periphery of said bottom portion to provide, when engaged with support means outside the basket, partial support for the latter,

b. an elongated member extending transversely across said bottom portion with terminal elements beyond the periphery of both sides thereof to provide, when engaged with support means outside the basket, lateral support for the latter, whereby the basket is provided with three-point support,

c. an upper rim portion of relatively heavy wire,

d. side and back wire portions secured to said rim and bottom portions,

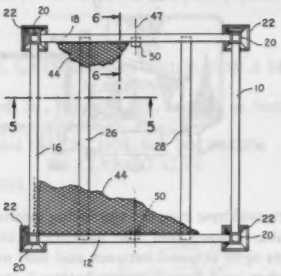
e. a pivoted front portion providing access to the interior of the basket, and

f. detachable means latching the front portion.

4,056,195
SUPPORTING BASE FOR RACK

William Johnson Keith, Greenville, S.C., assignor to Metal Products Corporation, Greenville, S.C.

Continuation of Ser. No. 482,858, June 25, 1974, abandoned.
This application Apr. 12, 1976, Ser. No. 675,818
Int. Cl.[2] A47F 5/01
U.S. Cl. 211—153 1 Claim



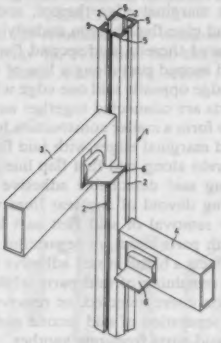
1. A supporting base for a rack comprising:
a. four "c" channel members joined end to end defining a rectangular frame;
b. said "c" channel members having an opened side facing the center of said frame and include a top and bottom flange joined by a vertical flange,
c. a rectangular shaped expanded metal member corresponding in size to said frame for spanning said rectangular frame;
d. free edges of said expanded metal member extending in two of said "c" channel members and being secured thereto so as not to have an exposed edge, said two channel members being in opposing relationship,
e. cross braces carried below said expanded metal member with ends thereof engaging said channel members;
f. an abutment member carried by each of said "c" channel members other than said two opposing "c" channel members, said abutment members extending below said top flanges of said other two "c" channel members; and
g. said expanded metal member sloping downwardly to said abutment members and being supported thereon providing an inclined base surface for stacking articles:
whereby stacked articles on said supporting base slope inwards reducing the tendency of said articles to fall from said rack.

4,056,196
SUPPORTING FRAMEWORK FOR SHELVES

Egon Brauning, Weil am Rhein, Germany, assignor to Fehlbaum, Switzerland

Filed June 8, 1976, Ser. No. 694,110
Claims priority, application Switzerland, June 16, 1975, 7789/75
Int. Cl.[2] A47F 5/10; A47B 57/26
U.S. Cl. 211—207 2 Claims

1. In a shelf supporting framework having hollow crosspieces guided at right angles to the hollow uprights of the framework in longitudinal slots in said uprights, each of said crosspieces connecting two adjacent uprights and having at both ends a locking bolt aligned along the longitudinal axis of the crosspieces and mounted in a bearing element for rotation about and sliding motion along said longitudinal axis, one end of said locking bolt having a head which can be inserted through said slot into the cavity within the upright and which locks the upright and crosspiece together when rotated about 90°, said locking bolt further carrying a blocking element connected to the bolt shaft and accessible via an aperture in the crosspiece wall, said blocking element in the locked position abutting said bearing element and thus urging the bearing element into frictional engagement with the outside surface of the upright, the improvement comprising said blocking element being a collar to which a tab projecting out laterally from the collar through said aperture is attached, said bearing element being made of a resilient elastic material and projecting in

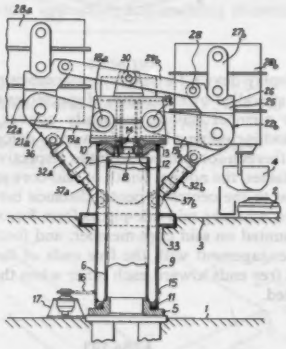


its unstressed state a short distance beyond the end of the crosspiece so that when the bolt is in the locked position the bearing element presses tightly against the outside surface of the upright, and centering means being provided at each end of the crosspiece which engage in said slot.

4,056,197
TURNING MECHANISM FOR THE MOVEMENT OF LADLES IN STEEL MILLS

Pierre Peytavin, Neuilly-sur-Seine, France, assignor to Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies), Paris, France

Division of Ser. No. 482,638, June 24, 1974, Pat. No. 3,942,650.
This application Dec. 23, 1975, Ser. No. 643,754
Claims priority, application France, June 26, 1973, 7323253; June 11, 1974, 7420103
Int. Cl.[2] B66C 1/44
U.S. Cl. 214—1 BC 5 Claims



1. A turning mechanism for the movement of heavy ladles in steel mills comprising
a rigid vertical shaft fixed by its lower extremity on a structure and having an upper extremity,
a turning assembly mounted for turning around the rigid vertical shaft, and comprising:
a tubular vertical element surrounding the rigid vertical shaft and mounted for turning around the shaft,
a first bearing for supporting the turning assembly and disposed appreciably at the lower extremity of and positioned between the tubular vertical element and the rigid vertical shaft,

a second bearing at the upper extremity of the rigid vertical shaft, and forming a support bearing supporting the weight of the turning member,

a head on top of and connected to the tubular vertical element, the head supporting by pivots, two arms in the form of diametrically opposed forks mounted in a pivoting fashion for receiving a casting ladle,

means for pivoting said arms and including jacks supported by the tubular vertical element and extending obliquely between the arms and the tubular vertical element,

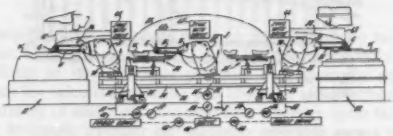
drive means for rotating the tubular vertical element and disposed near the lower extremity of the tubular vertical element.

4,056,198

TRANSFER AND TURNOVER MECHANISM FOR USE WITH POWER PRESS OR THE LIKE

Hans C. Boserup, Elmwood Park, Ill., assignor to Danly Machine Corporation, Chicago, Ill.

Filed Mar. 29, 1976, Ser. No. 671,106
Int. Cl.² B65G 47/90
U.S. Cl. 214—1 BC **27 Claims**



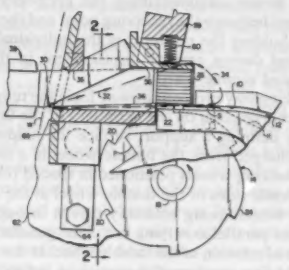
1. For use with a power press or the like, a transfer mechanism for transferring a large generally flat workpiece from a first horizontal open-topped receptacle to a second open-topped receptacle which is horizontally spaced therefrom, the combination comprising a pair of stands having transverse axes and coaxially spaced from one another, transfer driving means, a pair of gear boxes of equal length pivotally mounted in opposition closely adjacent the respective stands and having a reversible connection with the driving means for oscillating the gear boxes in unison parallel to one another through an angle of substantially 180° from a first horizontal position downwardly and then upwardly so that the gear boxes extend in the opposite direction in a second horizontal position, the gear boxes having first alined shaft means at the ends thereof, the gear boxes further having arms of equal length respectively connected to the first shaft means with the arms being spaced parallel to one another to provide a clearance space for passage of the workpiece between them, second alined shaft means at the respective ends of the arms, the second shaft means having gripper means for gripping the workpiece, at least one of the gear boxes having an output gear connected to the associated first shaft means, means for driving the output gear synchronized with the oscillation of the associated gear box so that the arm swings on the gear box in a direction of swing opposite to that of the gear box and relatively thereto at twice the angular rate with the result that as the gear boxes are swung from their first position to their second position by the transfer driving means the ends of the arms are swung from a first horizontal position above the first receptacle to a second horizontal position extending in the opposite direction and above the second receptacle, means for operating the gripper means cyclically so that the workpiece is removed from the first receptacle and deposited in the second, the arms being longer than the gear boxes so that the gripper means follows an arcuate path with the result that the workpiece is removed from the first receptacle with an upward component of motion and deposited in the second receptacle with a downward component of motion.

4,056,199

STACKER FOR GUM WRAPPING MACHINE

Lawrence W. Schoppee, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed June 1, 1976, Ser. No. 691,837
Int. Cl.² B65G 57/30
U.S. Cl. 214—6 BA **7 Claims**



1. In an apparatus for receiving sticks of product fed individually to a stacking station and for moving the stack of sticks in a downstream direction out of the stacking station for further handling, the improvement comprising

a. means for elevating each stick fed to the stacking station to allow the next stick to be fed into the bottom of a stack of sticks,

b. side guides at the stacking station for guiding the sticks so elevated,

c. mounting means for supporting said side guides for limited movement toward and away from the sides of the stack, and

d. biasing means for urging the side guides inwardly toward one another to keep the stack oriented in centered vertical relationship therebetween,

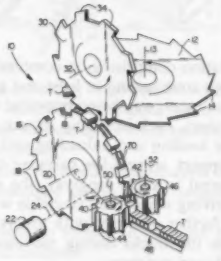
e. said side guides including abutments on their respective downstream edges for supporting and guiding the stack as succeeding sticks are fed into the bottom of the stack at the stacking station.

4,056,200

HIGH SPEED STACKER

Richard H. Provost, Brimfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed June 24, 1976, Ser. No. 699,512
Int. Cl.² B65G 57/00
U.S. Cl. 214—7 **10 Claims**



1. A high speed stacker for assembling a group of individual products in series comprising:

input feeding means for feeding the individual products sequentially along a product feed path;

a tumble wheel mounted for continuous rotation about an axis along the product feed path of the input feeding means with the wheel generally tangent to the path at a

receiving point, the wheel containing a plurality of product-receiving pockets on the periphery of the wheel, each pocket having a peripheral opening facing radially outwardly for individually receiving a product transmitted along the feed path to the receiving point of the wheel and carrying the individual product about the wheel to a discharge point arcuately displaced from the receiving point;

guide means circumscribing the periphery of the tumble wheel between the receiving point and the discharge point for holding the products in the individual pockets of the wheel during arcuate displacement in the continuously rotated tumble wheel;

a stacking tray projecting away from the tumble wheel at the discharge point on the periphery of the tumble wheel, the tray defining a support surface for holding the products discharged from the tumble wheel in a stack; and

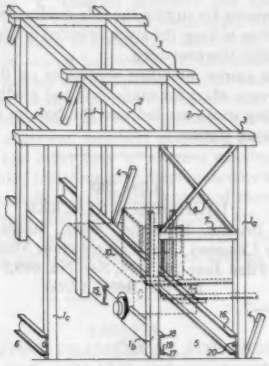
two stacking wheels positioned in spaced relationship and at opposite sides of the tumble wheel at the discharge point, the wheels being rotatably driven in opposite directions about parallel axes lying in a plane generally parallel to the axis of rotation of the tumble wheel at the discharge point, and being positioned to engage an individual product in a pocket and pull the product through the peripheral opening of a pocket toward the stacking tray.

4,056,201

HANDLING INSTALLATION FOR SUPPORTING DISPLACING AND STACKING LOADS IN PREDETERMINED POSITIONS

Marcel A. P. Giros, Route de Saint Dizier, Ancerville, France (55170)

Filed Feb. 23, 1976, Ser. No. 660,449
Int. Cl.[2] B65G *1/06*
U.S. Cl. 214—16.4 A **9 Claims**



1. An installation comprising, in combination,

a load-storage zone having at least one gangway extending therein, each gangway being provided on either side with fixed members, each including a track, and

a vehicle for loading and unloading said load storage zone having support wheels for carrying the vehicle on the floor external to each gangway, the support wheels including driving wheels and steerable wheels and the vehicle being further provided with rollers for supporting the vehicle on the tracks during movement of the vehicle along a chosen gangway,

the rollers including means for guiding the vehicle on the tracks,

the tracks being disposed at a sufficient height above the floor in the load-storage zone to maintain the support wheels off the floor when the vehicle is in the gangway,

an entrance to the gangway having a surface means for the support wheels,

the surface means bearing the support wheels to maintain the rollers above the level of the tracks until the vehicle is within the tracks, the surface means then having a declining portion down which the support wheels go until the rollers ride on the tracks and the support wheels clear the floor within the gangway, wherein

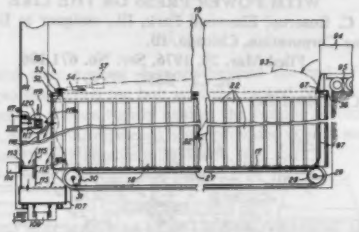
the rollers comprise at least one driving roller and one idle roller and wherein the driving roller and the idle roller are on different axles and the diameter of the driving roller is smaller than that of the idle roller.

4,056,202

BULK DISCRETE FIBROUS MATERIAL STORAGE AND FEEDING APPARATUS

Harold B. Mackenzie, Wheaton, Ill., and Ingvar G. Anderson, Dunedin, Fla., assignors to New Life Foundation, Wheaton, Ill.

Filed Oct. 28, 1975, Ser. No. 626,104
Int. Cl.[2] B65G *65/24*
U.S. Cl. 214—17 C **35 Claims**



1. In apparatus for bulk discrete fibrous material storage and feeding, including a bin receptive of a large volume load of the bulk material and having a bottom wall and upwardly extending side walls along the opposite sides of said bottom wall; movable conveyor means along said bottom wall and movable conveyor means along said side walls, said conveyor means cooperating to effect movement of material in the bin toward, and to discharge from, a discharge end of the bin; and means for driving said bottom wall and side wall conveyor means to run concurrently toward said discharge end to move the load of material progressively to discharge from said discharge end, the improvement comprising:

said side walls having frame structure;

suspension track means carried by said frame structure;

and suspension devices on the upper portions of said side wall conveyor means and running along said track means.

4,056,203

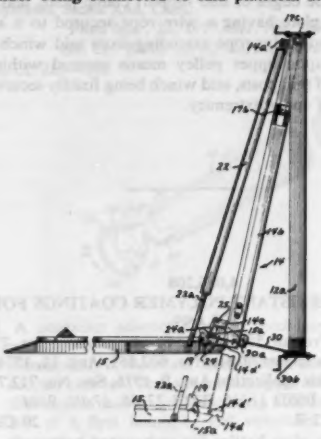
PLATFORM LIFT

Robert D. Meldahl, Granville, and Raymond L. Smalley, Carey, both of Ohio, assignors to Reb Manufacturing Inc., Carey, Ohio

Filed Oct. 15, 1976, Ser. No. 732,605
Int. Cl.[2] B60P *1/44*
U.S. Cl. 214—75 T **9 Claims**

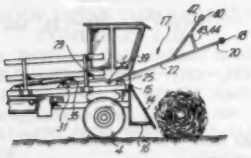
1. A vehicle having a platform lift comprising a framework mounted within the vehicle doorway, a slide frame mounted at its top end on said framework for pivotal movement in a vertical plane between a stored position and an operative position in which the slide frame is pivoted slightly outwardly from said framework, a platform mounted for elevational movement along said slide frame, said platform being pivotal from a substantially vertical stored position to a substantially horizontal operative position, a ramp pivotally connected to the lower horizontal part of said framework and having a width substantially the same width as said platform whereby the ramp forms a continuous support between said platform and said framework, said ramp being pivotal about its pivotal connection from a substantially vertical stored position to a substantially

horizontal operative position, a hydraulic cylinder for moving said platform and said ramp to and from said stored and said operative positions and selectively lowering and raising said platform through a range of positions below and to a position disposed adjacent said lower horizontal part, said hydraulic cylinder being connected to said platform at a point spaced



outwardly from the pivot point of the platform to said slide frame, locking means on said frame for selectively locking said platform in its horizontal position, and manually operable means for selectively raising and lowering said platform independently of said hydraulic cylinder, whereby upon failure of said hydraulic cylinder the manually operable means may be used to operate said platform.

4,056,204
BALE LOADING ASSEMBLY
Paul Spasuik, Box 146, Unity, Saskatchewan, Canada
Filed Apr. 6, 1976, Ser. No. 674,725
Claims priority, application Canada, Feb. 2, 1976, 244776
Int. Cl.[2] B60D *1/00*
U.S. Cl. 214—83.3 **7 Claims**



1. Bale loading assembly for use with a bale loader for handling bales of hay or the like, said bale loader being of the type of a mobile platform of an elongated, generally rectangular shape including two sides and a loading front end, said bale loading assembly comprising:

a. ramp means pivotally secured to said loading front end for pivotal movement about a first lateral axis generally coincident with said front end, said ramp means normally being inclined downwardly and forwardly of said front end of the platform;

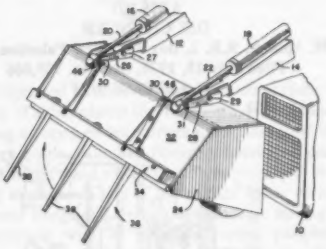
b. a first drive means operatively connected to said ramp means for selectively adjusting the inclination of said ramp means;

c. bale pulling means including bale engagement means secured to one end of said bale pulling means and having an extended position forwardly and in a surrounding posture of said bale, a ground engaging position and a retracted position, said bale engagement means including a pair of arms for simultaneous generally pivotal movement operatively about a second lateral axis generally parallel with said first lateral axis in planes generally coincident with planes perpendicular to said platform and located adjacent to said sides of the platform, said pair of arms having free ends, and said bale engagement means further including ground engagement means mounted on free ends of said pair of arms;

d. second drive means operatively connected to said bale pulling means for selectively displacing said bale engagement means from said extended position wherein said bale engagement means is located ahead of said front end in a generally co-planar relationship with said mobile platform, to said ground engaging portion, wherein said bale engagement means is located ahead of said front end at the ground level, and to said retracted position wherein said bale engagement means is generally co-planar with said platform and located on said platform adjacent said front end thereof, said second drive means further including a pair of levers, each of said pair of levers being secured with its one end, to one side of the platform for pivotal movement about said second lateral axis and in a plane generally perpendicular to said platform and located at the respective side thereof, the opposite end of each of said levers being pivotally secured by a pivot joint to the respective ends of said arms remote from said free ends thereof; and

e. guide means operatively connected to said bale pulling means to guide movement of said bale engagement means from said ground engaging position to said retracted position along a locus generally parallel with the inclination of said ramp means.

4,056,205
LOADER ATTACHMENT
John Lewis Etzler, IV, Rte. 2, Box 367, Troutville, Va. 24175
Filed Oct. 22, 1975, Ser. No. 624,641
Int. Cl.[2] G02F *3/81*
U.S. Cl. 214—145 R **3 Claims**



1. An implement receiving hitch for use with a front loader having a pair of vertically adjustable lift arms and a load bucket having a top surface and a front opening defined by a rim, said hitch comprising:

an elongated hollow four-sided box-shaped member having a length substantially equal to the length of said load bucket,

a plurality of apertures formed in first and second sides of said box-shaped member,

sleeve means for lining said apertures and for receiving said implement,

bracket means for attaching said box-shaped member to said load bucket,

backing straps located within said load bucket,

first threaded fastening means for attaching said hitch to said load bucket, said first fastening means passing through third and fourth sides of said elongated box-shaped mem-

ber, the top surface of said load bucket, and said backing straps, and

second fastening means for attaching said bracket means to said load bucket.

4,056,206

APPARATUS FOR UNLOADING ROD-LIKE ARTICLES FROM CONTAINERS

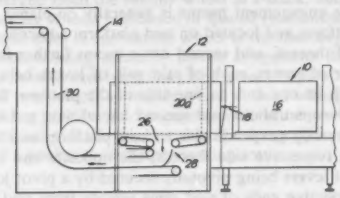
George Robert Bennett, London, England, assignor to Molins Limited, United Kingdom

Filed Apr. 28, 1976, Ser. No. 681,191

Claims priority, application United Kingdom, May 2, 1975, 18395/75

Int. Cl.[2] B65G *65/04*

U.S. Cl. 214—302 **16 Claims**



1. Apparatus for unloading rod-like articles from a tray, comprising a rotatable frame member having at least two tray carriers, the frame member being rotatable about a transverse axis through said frame member to effect interchange of said tray carriers between a first position in which a full tray may be received by a carrier and a second position in which said full tray in said carrier is positioned to discharge its contents into a hopper or the like, and means for lifting said axis around which the frame member is rotatable during movement of the frame member between said first and second positions including guide means for constraining both lifting and rotation of the frame member as it is moved between said positions, said guide means preventing rotation about said axis until said lifting has started.

4,056,207

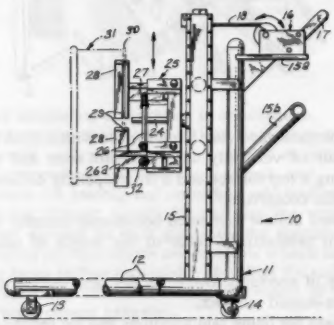
DIE CHANGER

James W. Spilker, R.R. 2, Box 195, New Palestine, Ind. 46163

Filed July 15, 1976, Ser. No. 705,666

Int. Cl.[2] B66F *9/18*

U.S. Cl. 214—652 **3 Claims**



1. A die changing device, comprising, in combination, a frame, a pair of posts secured to said frame for supporting a pair of guide channels, a winch secured to said frame for raising and lowering support clamp plate, a die lifting fixture freely received upon shaft means extending from said support clamp plate, and die clamp finger means secured to said lifting fixture; said posts being parallel spaced apart and fixedly secured to parallel spaced apart and horizontal leg members of said frame, and said guide channels being parallel spaced apart and fixedly secured, one each in said posts, said guide channels freely receiving a pair of rollers secured to shaft means extending from the side edges of said support clamp plate, and said support clamp plate having a wire rope secured to it at its upper center, said wire rope extending from said winch and being carried upon upper pulley means secured within an upper portion of said posts, said winch being fixedly secured to said frame at its upper extremity.

4,056,208

CAUSTIC-RESISTANT POLYMER COATINGS FOR GLASS

George Wyatt Prejean, 5807 Lodge Creek, Houston, Tex. 77069

Continuation-in-part of Ser. No. 603,661, Aug. 11, 1976, abandoned. This application Aug. 9, 1976, Ser. No. 712,700

Int. Cl.[2] B65D *11/16*; B32B *27/38, 17/06, 9/04*

U.S. Cl. 215—12 R **20 Claims**

1. Returnable glass bottles for carbonated beverages, said bottles being coated on the outer surfaces with a clear, cross-linked resin providing abrasion resistance and protection from flying glass in care of fracture, said coating being caustic-resistant, exhibiting strong adherence to glass even after repeated treatments with 5% aqueous NaOH at 80° C, said clear, abrasion- and causticresistant coating being at least 8 mils thick and comprising:

1. a cured primer layer on the glass, and

2. an outer layer of a copolymer of ethylene,

said primer layer (1) consisting essentially of

A from 0.5 to 5% by weight of an organofunctional silane of the formula $(RO—)_3Si\ (CH_2—)_xR^1$, where

RO— is a hydrolyzable alkoxy group in which R is an alkyl radical of 1 to 4 carbon atoms,

R^1 is a functional group selected from $—NH_2$,

$$—O—CH_2—\underset{\diagdown\ \diagup}{CH}—CH_2\text{, and}$$

$$—\overset{HCl}{\overset{|}{N}}H—CH_2—CH_2—NH—CH—CH_2—C_6H_4—CH=CH_2,$$

and

x is an integer from 1 to 4, inclusive,

B. an epoxy resin,

C. a curing agent selected from the group consisting of amines and reactive polyamides containing excess amine groups,

and optionally at least one member of the group consisting of

D. a water-soluble metal salt, and

E. diethylene glycol monoethyl ether,

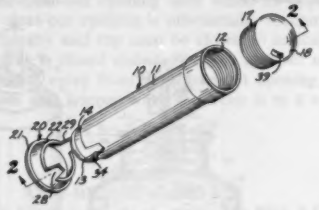
and the copolymer of said outer layer (2) consisting essentially of a random copolymer of ethylene in which the alpha, beta-unsaturated carboxylic acid is selected from the group consisting of acrylic acid and methacrylic acid having from 10% to 100% of the carboxyl groups ionized by metal ions having an ionized valence from one to three, inclusive, and in which the ethylene content of the copolymer is at least 70 mol %, based on the copolymer, the alpha, beta-unsaturated carboxylic acid content of said copolymer is from 0.2 to 5 mol %, inclusive, based on said copolymer, and any third monomer component optionally copolymerized in said copolymer is a monoethylenically unsaturated monomer.

4,056,209

MEDICATION BOTTLE HAVING A SAFETY CAP

Robert J. Winkler, Santa Ana, and Clarence R. Possell, San Diego, both of Calif., assignors to W.P. Energy Technology Systems, Santa Ana, Calif.

Filed Mar. 23, 1977, Ser. No. 780,511
Int. Cl.[2] B65D *55/02, 85/56;* A61J *1/00*
U.S. Cl. 215—215 5 Claims



1. A container adapted to store medicine or similar substances, comprising:

a substantially cylindrical enclosure including a first and second end, said first end including an end surface formed thereacross said end surface being conformed in the manner of a first hemispherical structure on the exterior thereof;

an internally threaded segment formed on the interior surface of said second end;

a cap assembly including an exteriorly threaded segment conformed for threaded engagement in said internally threaded segment and a second hemispherical structure of a radius greater than the radius of said exteriorly threaded segment extending therefrom;

a first and second diametrically opposed key slots formed in said second hemispherical structure; and

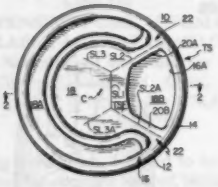
a key assembly including a cylindrical frustum conformed to receive said first hemispherical structure on the interior thereof, a disc attached to one end of said frustum and extending transversely thereacross, and a first and second key member formed on the other end of said frustum and dimensioned for corresponding receipt in said first and second key slot.

4,056,210

SPLASH PROOF DRINK THROUGH BEVERAGE CONTAINER LID

Patrick T. Boyle, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Continuation-in-part of Ser. No. 678,751, April 21, 1976, abandoned. This application Sept. 13, 1976, Ser. No. 722,402
Int. Cl.[2] A47G *19/22;* B65D *41/32, 83/00*
U.S. Cl. 220—90.4 20 Claims



1. A flexible plastic lid for open mouthed containers having an annular bead or rim defining the open mouth thereof, comprising:

a rim receiving annular bead cavity formed in the outer periphery of said lid and having an upper surface for overlying a container rim and a dependent annular skirt outboard of said upper surface;

a central web portion bounded by said bead cavity having a raised central area defined therein connected to and at substantially the same level as said upper surface by a pair of divergent arms formed in said central web and including a respective pair of raised elongated surface areas merging with said upper surface and said raised central area; and

finite score line means formed in said raised central area substantially transversely oriented with respect to said divergent arms and a pair of tear line means defined one in each of said upper surfaces of said divergent arms, said tear line means extending from respectively opposite ends of said score line means to a point substantially inboard of the said upper surface of said bead cavity;

said score and tear line means defining tear tab means in said raised central area and a wedge shaped tear-away segment in said lid.

4,056,211

SUPPORT AND RETENTION LINER GASKET

Homer Zumwalt, Galesburg, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

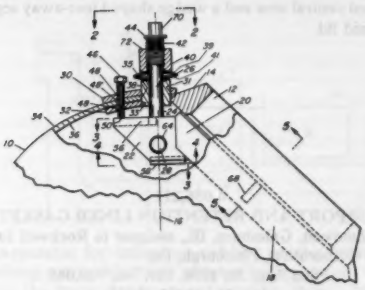
Filed Aug. 30, 1976, Ser. No. 719,045
Int. Cl.[2] B65D *25/18*
U.S. Cl. 220—9 G 3 Claims

1. A refrigerated cabinet construction comprising: a food liner formed of a thin plastic sheet having side walls and an end wall defining an open ended storage space, said food liner side walls being capable of limited flexure whereby exceeding the limit would subject said side walls to cracking, said side walls terminating at the open end of the storage space with an outwardly turned peripheral flange; an enclosure having outside walls terminating with an inwardly turned peripheral rim having an inner edge circumscribing an area larger than combined area including said open end and said flange; a channel formed integrally with the inner edge of the rim to extend inwardly thereof having spaced surfaces defining a frontally opening groove of a predetermined width, said groove being generally parallel with said outside wall; a liner support gasket formed of an elastomeric material for mounting the food liner on the enclosure without flexure of said food liner, said gasket including a base portion having a free width greater than the width of the groove so as to be resiliently compressively insertable therewithin, said gasket having a slot in an intermediate portion thereof which said slot includes opposed surfaces which are generally perpendicular to said base portion for receiving the flange of the food liner; an outwardly projecting portion of said gasket being resiliently deflected by one of said spaced surfaces upon insertion of said base portion into the channel to narrow the width of the slot such that the opposed surfaces thereof compressively grip the flange without imparting flexure to the side wall.

4,056,212
PORTABLE PRESSURE VESSEL AND CLOSURE

Jon Petty, Newton, N.J.; Beverly D. Trott, and Joseph E. Backofen, both of Columbus, Ohio, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 11, 1977, Ser. No. 776,692
Int. Cl.[2] B65D *45/00*
U.S. Cl. 220—244 3 Claims



1. A closure for a pressure vessel for safely storing and transporting an improvised explosive device therein which comprises:

a spherically shaped body member having a vertical axis, a body bushing bore being disposed therethrough concentric with said vertical axis, an access port disposed in an upper hemispherical side of said body member, and two vessel threaded bores transversely passing therethrough and being proximate to said vertical axis;

a reinforcing ring member circumferentially welded to the peripheral edge of said access port, said reinforcing ring member being inclined at approximately 45° with respect to said vertical axis of said body member;

internal door means pivotally held in juxtaposition to said reinforcing ring member for providing rapid unobstructed access through said access port and for rapidly closing said access port of said body member to completely seal said improvised explosive device therein; and

a door stop fixedly welded to said reinforcing lug for stopping said internal door means when it reaches a closed position;

a pair of reinforcing plates fixedly welded to said body member, said pair of reinforcing plates having plate bushing bores therein axially aligned with said body bushing bore, plate threaded bores passing transversely therethrough and being concentrically aligned with said vessel threaded bores;

a tubular bushing fixedly positioned in said plate and vessel bushing bores;

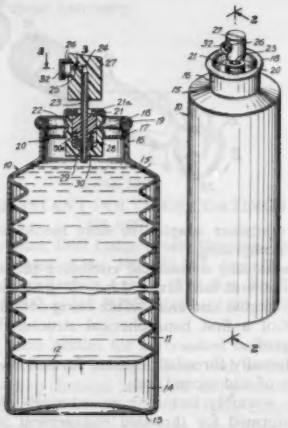
a pair of door closing adjusting bolts threadedly positioned in said plate threaded bores and said vessel threaded bore, said pair of bolts having ends protruding into the interior of said body member;

a single pivot "T" bar means pivotally positioned in said bushing and rotatably connected to said internal door means for rapidly opening and closing said internal door means.

4,056,213
PRESSURIZED DISPENSER FOR AQUEOUS EMULSION PAINTS

David Stern, Roslyn, N.Y., assignor to Martin Paint and Chemical Corporation, Jamaica, N.Y.

Continuation-in-part of Ser. No. 168,916, Aug. 4, 1971, abandoned. This application Jan. 14, 1975, Ser. No. 540,812
Int. Cl.[2] B65D *35/28*
U.S. Cl. 222—95 12 Claims

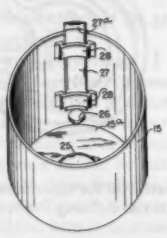


1. A pressurized dispenser for aqueous latex paint wherein the binder is an acrylic polymer or a vinyl acetate-lower alkyl acrylic ester copolymer, comprising a container having therein a collapsible piston adapted to contain a latex paint with a propellant under pressure in the space between the piston and the wall of the container, a valve controlling the discharge of paint from within the piston, a nozzle into which the paint is conducted for discharge in the form of a spray or mist, and a cap for closing the nozzle orifice and providing at most a free evaporation space about the nozzle orifice which is less in volume than is required for the evaporation, to a substantially solid residue, of any paint clinging to the wall of the nozzle orifice at the termination of a fractional discharge of the contents of the container.

4,056,214
EASY EMPTY SEED HOPPER

Leon E. Day, West Memphis, Ark., assignor to George G. Watts and Jeff D. Pratt, both of Memphis, Tenn.

Filed Apr. 7, 1976, Ser. No. 674,386
Int. Cl.[2] A01C *15/00*
U.S. Cl. 222—608 4 Claims



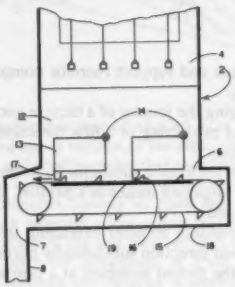
3. An elongated seed hopper, said hopper being cylindrical and having a removable and closable top and a bottom closed except for a seed-exit opening, said hopper being otherwise imperforate, there being a small seed-clean-out opening

through the cylindrical wall of said hopper next to said bottom, a closure member for said clean-out opening having an outer surface complementary to the inner face of said hopper cylinder and having opposite parallel edges, bracket means fixed in said hopper holding said closure member close to said hopper cylindrical wall while permitting sliding movement of said closure member along said hopper and axially thereof, said closure member being of a length to engage said bottom and to close said seed-clean-out opening only when its upper end opposite said clean-out opening is substantially touching said closed top, whereby said top must be closed to indicate said clean-out opening is closed and said closure member may be easily reciprocated away from said clean-out opening to remove seed from said hopper when the latter is in a vertical position.

4,056,215
ANTI-BRIDGING DEVICE

Ernst Zwahlen, Uster, Switzerland, assignor to Elex A.G., Zurich, Switzerland

Filed Apr. 26, 1976, Ser. No. 679,883
Int. Cl.[2] B65G *3/12*
U.S. Cl. 222—231 **6 Claims**



6. In combination with an electrostatic precipitator, a device for preventing bridging in a hopper, the hopper including an upper inlet portion in communication with a bottom opening of an electrostatic precipitator and a lower outlet position with inclined sidewalls disposed therebetween, the device comprising: at least one scraper disposed along at least one of said sidewalls with at least one upper corner pivotally attached at said one upper corner to said one sidewall of said hopper; and, means to contact and raise said scraper whereby said scraper is moved upwardly by said means during contact therewith and downwardly after said contact therewith; thereby preventing bridging of material at said lower outlet portion.

4,056,216
LIQUID DISPENSING PUMP AUTOMATICALLY SEALABLE AGAINST LEAKAGE

Paul M. Kotuby, Naugatuck, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Filed Apr. 13, 1976, Ser. No. 676,415
Int. Cl.[2] G01F *11/04*
U.S. Cl. 222—385 **10 Claims**

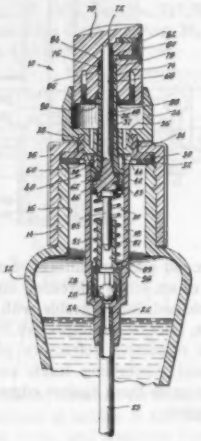
1. In a finger-operable pump, adapted to be mounted on a container to dispense the contents thereof, including a housing defining a pumping chamber; a plunger having a stem projecting outwardly at one end of the housing and defining a discharge passage therethrough, the plunger being telescopically received in the pumping chamber for reciprocal movement away from and back to a home position and making a sliding piston fit with the housing; and check valve means for preventing return flow of liquid through the pumping chamber; an automatically operable seal arrangement for preventing leakage through the pump, said seal arrangement comprising:

A. a valve seat formed about the plunger discharge passage,

B. stopper means positioned for cooperative sealing engagement with said valve seat,

C. an actuator button formed with a socket, having a base, that receives the projecting end of the plunger stem in axially reciprocally movable relation, said actuator button being movable toward and away from a plunger-operation position with said socket base at least partially abutting the projecting end of the plunger stem to then move the plunger away from its home position,

D. link means disposed in the discharge passage, interconnecting said actuator button and stopper means, to disengage said stopper means when said actuator button is in the plunger-operating position,



E. seal means for sealing the projecting end of the plunger stem and said base when said actuator button is in the plunger-operating position, said seal means comprising

1. a ring shaped protuberance formed on one of the projecting ends of the plunger stem and said base; and
2. a ring shaped depression, formed on the other of the projecting ends of the plunger stem and said base interfittable with said protuberance, and

F. means for urging said stopper means into sealing engagement with said valve seat and said actuator button away from the plunger-operating position and, then, for urging the plunger toward its home position.

4,056,217
SLIDING GATE VALVE FOR MOLTEN METAL WITH ADJUSTABLE PLATES

Giovanni Aliprandi, Genoa, and Roberto Ricci, Genoa-Pegli, both of Italy, assignors to SNAC S.p.A. Refrattari Argille e Caolini, Italy

Filed Dec. 5, 1975, Ser. No. 637,964
Claims priority, application Italy, Apr. 24, 1975, 12585/75
Int. Cl.[2] B22D *37/00*
U.S. Cl. 222—600 **7 Claims**

1. A device for discharging smelted metal from a container, comprising:

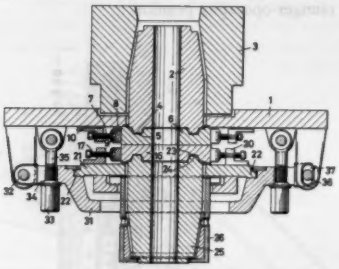
a first discharger plate unit, secured in use to a container comprising a first and stationary metal frame and a first and stationary refractory plate normally supported thereby and having a discharge hole;

first mounting means for tiltably mounting the first plate unit on the container;

a second discharger plate unit comprising a second metal frame and a second refractory plate normally supported thereby and having a discharge hole;

second mounting means for mounting the second unit for sliding movement of the second plate along and in contact

with the first and stationary plate to mutually align the holes in an opening step of the sliding movement and to place the holes out of mutual alignment in a closing step thereof, the mounting means comprising a third, normally stationary metal frame secured to the container and having elongate mutually parallel guides, the second frame having edges slidable along the parallel guides, the second mounting means also comprising means for tiltably mounting the third frame and thereby the guides and the second frame on the container; and



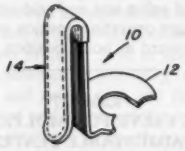
first and second plate mounting means, each comprising a plurality of set screws threaded into a respective frame, engageable and disengageable with the respective refractory plate, sides of the respective frame sliding integrally with the respective refractory plate and having leaf springs and positioning listels co-operating with said screws to press them against edges of the respective refractory plate.

4,056,218

DEVICE FOR CARRYING A HANDGUN

Alex J. Barna, 1216 Crawford St., Duquesne, Pa. 15110

Filed May 11, 1976, Ser. No. 685,272
Int. Cl.[2] F41B *33/00*
U.S. Cl. 224—2 C **7 Claims**



1. A device for releasably securing a handgun to body wearing apparel comprising,

a shaped member having a pair of leg portions adapted for releasable engagement to body wearing apparel,

attachment means formed integral with and extending laterally from the end of one of said leg portions for releasably engaging the handgun,

said attachment means including a single "C" shaped portion having an opening transverse to the longitudinal axis of said leg portions, said "C" shaped portion arranged to receive the body of the handgun to facilitate installation of said shaped member while the handgun is in operation, and

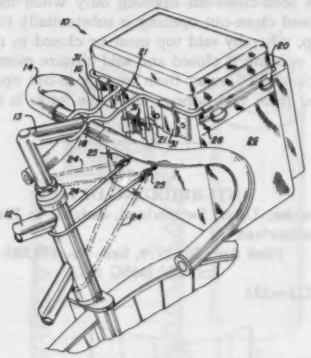
stabilizing means covering a portion of one of said leg portions for frictionally engaging the body of the handgun for maintaining said shaped member in position on the handgun.

4,056,219

BICYCLE HANDLEBAR PACK AND SUPPORT THEREFOR

Edward K. Hine, Jr., Louisville, Colo., assignor to Hine-Snowbridge, Inc., Boulder, Colo.

Filed Apr. 9, 1976, Ser. No. 675,430
Int. Cl.[2] B62J *7/06*
U.S. Cl. 224—36 **8 Claims**



1. A handlebar pack and support therefor comprising:

a support housing:

means for engaging the joinder of a bicycle gooseneck and handlebar and projecting in a first direction in a cantilevered manner;

forked members projecting substantially in the first direction from the engaging means in a parallel, spaced apart relationship; and

at least one depending member extending from the support in a second direction substantially perpendicular to the plane of the forked members at a position between the forked members and the engaging means;

a pack comprising:

a substantially rectilinear enclosure having a top portion, a bottom portion, two side portions, a front portion, and a back portion;

parallel pockets defined one each in each side portion of the enclosure and adapted to receive the forked members of the support; and

securing means disposed upon the back portion of the enclosure to releasably engage the portion of the support including a depending member adjacent the back portion of the enclosure; and

a resilient member attached to the support and adapted to engage an adjacent portion of a bicycle when the support and pack are attached to a bicycle;

whereby, the engaging means and the resilient member are adapted to stably and securely attach the support to a bicycle in a prestressed manner, the forked members and depending member are adapted to engage the pack with the securing means holding the pack to the support in a substantially inflexible manner.

4,056,220

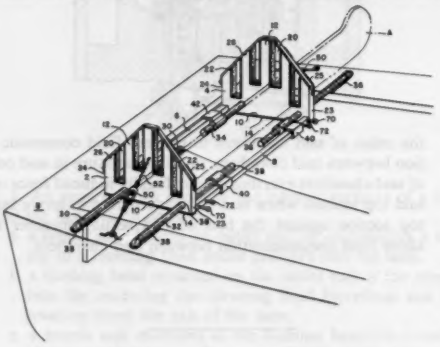
PORTABLE BOAT-CARRIED RACK FOR WATER SKIS AND TOW ROPES

Steven M. Trimble, 1302 Banbury Road, Apt. H, Kalamazoo, Mich. 49001

Filed July 30, 1975, Ser. No. 600,383
Int. Cl.[2] B60R *9/08*
U.S. Cl. 224—42.45 R **1 Claim**

1. A rack for water skis adapted to be mounted on a boat so that it extends athwart the boat, the rack comprising two transversely spaced, paralleled planar end members having substantially the same size and shape, elongated members

connecting the end members to form a unitary structure of fixed length, each end member having a horizontal bottom surface, substantially vertically extending front and rear lower surfaces and inclined front and rear upper surfaces which converge upwardly to an apex substantially at the center of the end member, a plurality of open ended vertical slots formed in each end member and extending downwardly from both of the front and rear inclined upper surfaces thereof, the slots being substantially the same vertical dimension, each slot in one of said end members being transversely aligned with a corresponding slot in the other end member whereby a ski placed on its side edge in any pair of aligned slots will be in relatively, vertically stepped position and relation with respect to skis



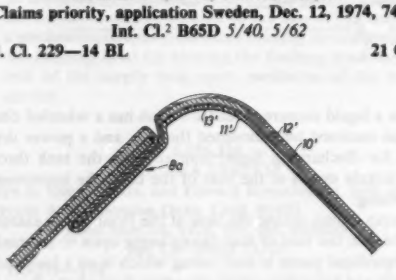
placed in any other pair of aligned slots in the same front or rear inclined upper surface of the rack, all of the slots being of such a size and configuration that each pair of aligned slots will receive and retain at least one ski positioned on its side edge, each end member having at least two openings extending therethrough adjacent a lower part thereof in a direction normal to the plane of the end member, and an elongated rod-like supporting member positioned in each opening for sliding movement through the opening whereby the end portions of the supporting members, not positioned within the rack between the end members, provide means external to each end member for supporting the rack on corresponding boat parts of various transverse spacings.

4,056,221

LAMINATED PACKAGE

Lars-Erik Piltz, Dalby, and Claes Tvingstedt, Malmo, both of Sweden, assignors to AB Akerlund & Rausing, Lund, Sweden

Filed Dec. 8, 1975, Ser. No. 638,367
Claims priority, application Sweden, Dec. 12, 1974, 7415580
Int. Cl.[2] B65D *5/40, 5/62*
U.S. Cl. 229—14 BL **21 Claims**



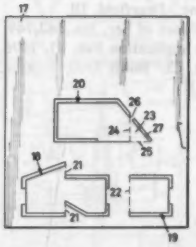
1. A blank for making a container comprising a first member of a first thickness including a bottom field and a plurality of side fields, said side fields including side edges defining cut-out portions between adjacent side edges, and second member means of a second thickness less than said first thickness arranged in overlying relation to said first member and extending beyond said side edges of said side fields so as to completely fill said cut-out portions, said second member means comprising two sheets of flexible material adhered to and completely enclosing said first member, said two sheets of flexible material extending beyond said side fields and said cut-out portions to define collar means, said container when erected from said blank having the adjacent side edges of each cut-out portion in abutting relationship with each other so that there is no overlap of said first member upon itself.

4,056,222

COMPARTMENTALIZED STRUCTURE WITH PIVOTABLE SEPARATING WEBS

Heinz Focke, Verden, Germany, assignor to Focke & Pfuhl, Verden, Germany

Filed Aug. 25, 1976, Ser. No. 717,798
Claims priority, application Germany, Aug. 26, 1975, 2537811
Int. Cl.[2] B65D *3/24, 5/48*
U.S. Cl. 229—15 **12 Claims**



1. In a compartmentalized structure for insertion in packages for separating articles such as bottles or the like, by means of longitudinal and cross webs, said structure comprising a flat blank serving as the longitudinal web, said flat blank being provided with percut lugs adapted to be pivoted to form cross webs, the improvement comprising:

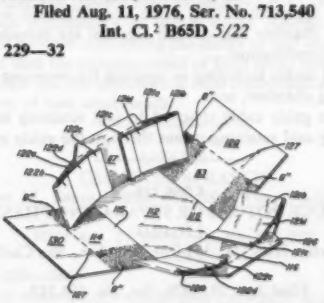
at least one lug being formed in the blank outside of the separating region determined by the cross webs and being extended into the separating region at right angles to the longitudinal web by folding it about at least two fold lines.

4,056,223

FOLDABLE CONTAINER AND BLANK THEREFOR

Michael M. Williams, Arlington, Tex., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Aug. 11, 1976, Ser. No. 713,540
Int. Cl.[2] B65D *5/22*
U.S. Cl. 229—32 **6 Claims**



1. A foldable container formed from a single blank of sheet material and having at least one reinforced corner, said container comprising a bottom section; end and side panels foldably connected respectively to first and second peripheral segments of said bottom section and extending upright therefrom and delimiting an open top, said upright end and side

panels forming at least one corner therebetween; a top closure flap foldably connected to at least one of said side panels; and a corner-reinforcing member foldably connected to an edge of the end panel adjacent said corner, said corner-reinforcing member including a first section foldably connected to the end panel edge and having a surface thereof secured to an interior surface of the adjacent side panel, a second section having a first portion foldably connected to said first section and secured to the opposite surface thereof in foldback relation and a second portion foldably connected to said first portion and extending angularly therefrom and disposed in inwardly spaced relation with respect to said end panel edge, and a third section foldably connected to said second portion and secured to the interior surface of said end panel.

4,056,224

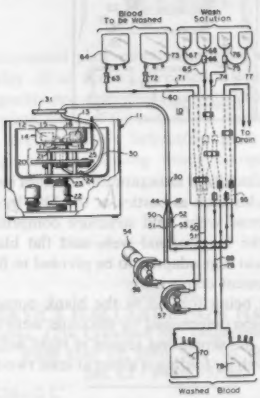
FLOW SYSTEM FOR CENTRIFUGAL LIQUID PROCESSING APPARATUS

Houshang Lolachi, Rockville, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 562,749, March 27, 1975, abandoned. This application Feb. 11, 1976, Ser. No. 657,186

Int. Cl.[2] B04B *5/02, 7/00, 15/12*

U.S. Cl. 233—14 R **9 Claims**



1. A leader assembly for installing a flow system of the type having at least one flexible-walled liquid processing chamber and a connecting flexible conduit segment in a centrifugal processing apparatus having guide means through which the processing chamber and conduit segment are threaded, comprising, in combination:

retaining means including an opening for receiving the processing chamber; and

a flexible guide cable attached to said retaining means for pulling said retaining means through the guide means.

4,056,225

CENTRIFUGE ROTOR FOR SEPARATING PHASES OF A LIQUID

George Norton Hein, Jr., 331 Chesham Ave., San Carlos, Calif. 94070

Filed Apr. 29, 1976, Ser. No. 681,312

Int. Cl.[2] B04B *7/02, 9/06*

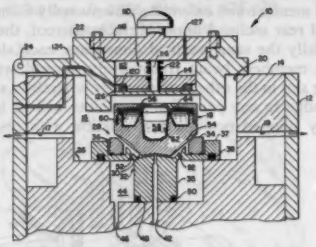
U.S. Cl. 233—20 R **6 Claims**

1. A rotor for use with a centrifuge, said rotor comprising:

a container having a lower section with at least two chambers positioned within said rotor for receipt of a fluid mixture;

a movable top section portion attached over said lower section of said container, said top section in an unrestrained orientation allowing fluid communication between said chambers; and

sealing means mounted adjacent said top section within said rotor for biasing said top section in a juxtaposed position over one of said chambers to seal said one chamber from



the other of said chambers to prevent fluid communication between said chambers, said fluid mixture in said one of said chambers exerting a centrifugally induced force on said top section when said rotor is rotating to move said top section against the bias of said sealing member to allow fluid communication between said chambers.

4,056,226

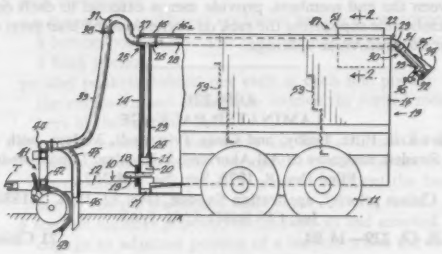
LIQUID MANURE SPREADER

James H. Hodgson, Vinton, Iowa, assignor to Chromalloy American Corporation, New York, N.Y.

Filed July 29, 1976, Ser. No. 709,662

Int. Cl.[2] A01G *25/09*

U.S. Cl. 239—172 **4 Claims**



1. In a liquid manure spreader which has a wheeled chassis with an enclosed tank mounted thereon, and a power driven pump for discharging liquid manure from the tank through spray nozzle means at the rear of the tank, the improvement comprising:

a pump casing within the tank at the front lower extremity thereof, the rear of said casing being open to the tank;

a centrifugal pump in said casing which is on a longitudinal axis and has a drive shaft extending through the front wall of the tank for connection to a power source;

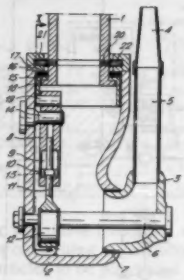
and a discharge pipe which has a vertical run extending from the top of the pump casing within the front of the tank, and a horizontal run which extends from the top of said vertical run inside the top of the tank, and through the rear of the tank, the spray nozzle means being on said horizontal run of the discharge pipe outside the rear of the tank.

4,056,227

APPARATUS FOR CLEANING TANKS AND THE LIKE

Olav Hakon Fismen, Kjaernes, 1400 Ski, Norway

Filed Dec. 18, 1975, Ser. No. 641,747
Int. Cl.[2] B08B 3/02; B05B 3/14
U.S. Cl. 239—227 7 Claims



1. An apparatus for cleaning the interior surfaces of a tank and the like, which comprises
   a. a supply tube having an outlet end for introducing a supply of a cleaning fluid under pressure into the tank,
   b. a flushing head mounted on the outlet end of the supply tube for receiving the cleaning fluid therefrom and for rotation about the axis of the tube,
   c. a nozzle unit mounted in the flushing head for rotation about an axis substantially perpendicular to the tube axis, the nozzle unit including
      1. a shaft mounting the nozzle unit rotatably in the flushing head for rotation about the shaft and
      2. a nozzle in communication with the flushing head for receiving the cleaning fluid therefrom, the nozzle having a jet outlet direction offset from the axis of rotation of the nozzle unit whereby the nozzle unit is rotated as a result of reaction pressure from a jet of cleaning fluid delivered through the nozzle,
   d. a hydraulic braking device coupled to the nozzle unit for variably controlling the rotational speed of the nozzle unit in dependence on the rotational position of the nozzle unit, the braking device comprising
      1. two members reciprocable relative to each other and
      2. means for varying the braking force of the device in dependence on the relative position of the two members whereby the rotational speed of the nozzle unit is variably controlled,
   e. a crank coupling one of the members of the braking device to the shaft of the nozzle unit for oscillating the braking device about an axis parallel to the axis of the shaft, and
   f. a mechanism coupling the other braking device member to the flushing head for rotating the flushing head about the axis of the supply tube upon oscillation of the braking device.

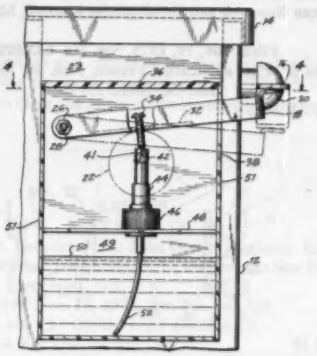
4,056,228

AROMA SYSTEM

Evelyn S. Rosenkrantz, and Edward Rosenkrantz, both of 4915 Tyrone Ave., Sherman Oaks, Calif. 91403

Filed May 14, 1976, Ser. No. 686,466
Int. Cl.[2] B05B 15/00
U.S. Cl. 239—274 1 Claim

1. An aroma emitting device for cooperative use with a toilet handle, or the like, comprising in combination: a housing, a refillable fluid reservoir carried by the housing, pump means communicating with said reservoir for generating a fluid mist, actuating means disposed in the path of a movable member for controllably and variably actuating said pump means so as to cause said mist to be generated proximate the movable member, said housing including an integral support wall extending at an elevation above that of the level of said fluid reservoir, said support wall comprising a shelf member extending substantially perpendicularly from and with respect to a substantially vertical wall making up said housing, said vertical housing wall extending upwardly to a downwardly facing U-shaped channel portion supported by upper edges of a wall of a toilet bowl holding water, said housing further including a removable and replaceable lid for enabling access to interior portions of said housing, said pump assembly including an outer housing supported integrally with said support wall shelf within the housing, a reciprocable plunger head carrying a spray nozzle, and a hollow dip tube communicating with said spray nozzle and extending below the level of said fluid, said actuating means comprising a bar member extending along an axis and pivotably supported by said support wall at an elevation above that of said plunger head, said bar member having substantially horizontal surfaces intermediate the junction of the bar member and said housing and its opposite end, said opposite end including an actuating portion extending at an



angle from and with respect to said axis, said opposite end comprising adjustable alignment means for positioning said actuating portion in the path of more than one type and shape of conventional toilet handle, said adjustable alignment means including male and female threaded members and locking means for securing said male and female threaded members integrally together in one of several possible relative positions, threaded fastening means for pivotally securing said bar member to said support wall, and adjustable biasing means carried by said bar member for engaging said plunger head during use, said biasing means comprising a threaded member capable of being adjustably manipulated upon removal of said lid such that a lower end thereof may be positioned at varying elevations, said adjustability of the threaded member providing means for variable controlling the stroke of said pump plunger head and thus the characteristics of fluid spray mist from said spray nozzle and the quantities of fluid discharged as a result of depression of said toilet handle.

4,056,229

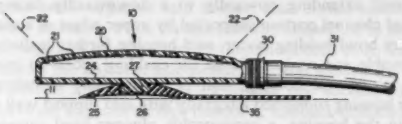
CAR WASH SPRAYER

Genevieve M. Jones, 10840 SE. 85th Ave., Portland, Oreg. 97266

Filed Apr. 27, 1976, Ser. No. 680,767
Int. Cl.[2] B05B 1/14
U.S. Cl. 239—288 1 Claim

1. A car wash sprayer comprising a sprinkler head having a hollow body with a top side and a bottom side, a downwardly protruding button formed integral with said bottom side in one-piece construction, perforations in said top side arranged to discharge a water spray upwardly and outwardly in all directions from said body, a water supply hose connection having a rotatable connector fitting extending laterally from said body, a suction cup having a socket recess receiving said button, and a flat flap formed integral with said suction cup in

one-piece construction and extending from one side of said suction cup to lie flat on a surface supporting said suction cup



and shield said surface from contact with said hose connection without interfering with the manipulation of said connector fitting.

4,056,230

METHOD OF CRUSHING PARTICLES OF MATERIAL IN A BALL MILL

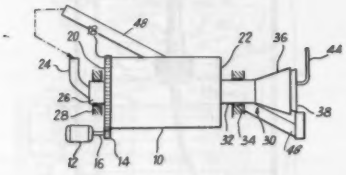
Jacques L. E. Decobert, Les Candeaux Eysus, France, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Nov. 19, 1975, Ser. No. 633,409

Claims priority, application France, Nov. 20, 1974, 74.38134

Int. Cl.² B02C *23/18*

U.S. Cl. 241—15 **5 Claims**



1. A continuous method of crushing metal particles in a ball-mill to produce metallic pigment, in which method: a mixture composed of balls and of a charge consisting of the metal particles to be crushed, a solvent and a lubricant is continuously introduced into a ball mill initially containing a quantity of balls; a mixture consisting of balls, crushed metal particles, solvent and lubricant being continuously recovered at the outlet from the mill; and the balls being separated from the recovered mixture by washing with solvent and reintroduced into the mill with a fresh charge, while the crushed metal particles with solvent are delivered separately from the balls; the content of non-volatile substances in the charge being between 20% and 80% by weight.

4,056,231

SCRAP TREATMENT

Nicholas A. Townsend, Bexley, England, assignor to British Steel Corporation, London, England

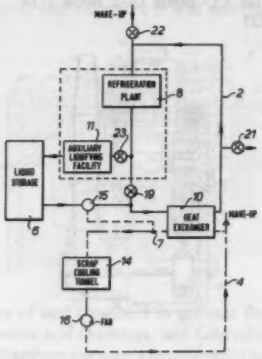
Filed Aug. 2, 1976, Ser. No. 711,076

Claims priority, application United Kingdom, Aug. 7, 1975, 33079/75

Int. Cl.² B02C *23/06*

U.S. Cl. 241—23 **14 Claims**

1. A process for fragmenting metal scrap includes cooling the scrap until it is brittle by contacting it with a first cooling agent which is gaseous and then fragmenting the scrap in its brittle state, said first cooling agent being cooled by being passed through a heat exchanger to which a second cooling agent is fed partly in the liquid phase and partly in the gaseous phase and from which the second cooling agent emerges in the gaseous phase, in which the improvement resides in said cooling agent being supplied to the heat exchanger partly from a liquid storage facility and partly directly from a refrigeration plant, the refrigeration plant being used in conjunction with a liquifier to supply the storage facility with liquid second cooling agent, and in which the gaseous second cooling agent is supplied to the refrigeration plant following its emergence from the heat exchanger said refrigeration plant, during periods in which the cooling of the scrap is interrupted, drawing



warm gas from an external source and, in conjunction with the liquifying plant, replenishing the liquid store in readiness for the next scrap cooling cycle.

4,056,232

PROTECTIVE DEVICE FOR ROTARY HAMMER BREAKER

Wilhelm Linnerz, Buttgen near Neuss, and Josef Tillmanns, Dusseldorf, both of Germany, assignors to Lindemann Maschinenfabrik GmbH, Dusseldorf, Germany

Filed Mar. 15, 1976, Ser. No. 666,910

Claims priority, application United Kingdom, Mar. 17, 1975, 11052/75

Int. Cl.² B02C *13/04*

U.S. Cl. 241—194 **10 Claims**

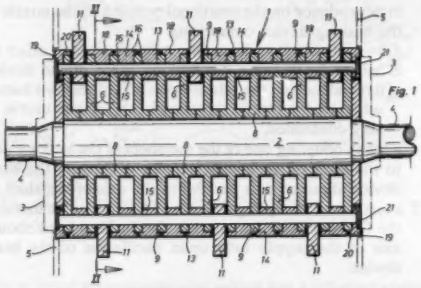


Fig. 1

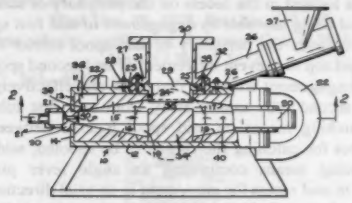
1. A protective device for a rotary hammerbreaker including a plurality of discs secured upon a rotor shaft, a plurality of rods extending through said discs and hammers pivotably mounted upon said rods between said discs, said protective device comprising a plurality of shields each including a hub mounted upon one of said rods between adjacent discs, and a circumferential segmental flange fixed to said hub extending over at least a part of the periphery of at least one of the adjacent discs between which said hub is mounted to protect said part of said periphery, each of said segmental flanges being configured to extend over a portion of the circumference of said hammerbreaker with said plurality of shields being fitted to said rotary hammerbreaker such that said segmental flanges are juxtaposed relative to each other to provide substantially continuous protection over the periphery of said discs.

4,056,233

APPARATUS FOR PULVERIZING SOLID MATERIALS

Edwin F. Fay, West Centennial Drive, Marlton, N.J. 08053

Filed Oct. 1, 1976, Ser. No. 728,749
Int. Cl.[2] B02C 19/06
U.S. Cl. 241—39 7 Claims



1. Apparatus for the pulverization of solid material into finely divided form comprising a generally circular grinding chamber for the particles to be pulverized formed between a pair of top and bottom heads, means for injecting a pressurized gaseous fluid into said chamber to establish therein a high velocity inwardly spiralling vortex of the gaseous fluid, means for injecting the material to be pulverized into said grinding chamber for entrainment of said particles of material into the outer reaches of said vortex for movement inwardly thereof toward a discharge outlet coaxial with the center of the vortex, and baffle means including a fixed member disposed centrally within the grinding chamber in axial alinement with said discharge outlet and extending vertically from the floor of said grinding chamber substantially beyond the horizontal median plane of said chamber to a level short of and in relatively closely spaced relation to the top head of said chamber, said baffle member having an external surface defining the inner wall of an annular zone within said grinding chamber which is closed at its bottom end and open at its top end, the top end of said baffle member having an outline defining a cross-sectional area which is at least substantially as great as that of the bottom end of said member and said inner wall of said annular zone being radially unobstructed across the top thereof and of a cross-sectional area at least equal to that of the inlet end of said discharge outlet to provide an unobstructed free space of vertically limited depth located between said topmost end of said baffle member and the top head of said grinding chamber, said space extending across said topmost end of said annular zone inner wall for unrestricted direct communication with said zone about the full peripheral extent of said wall, whereby those heavier and coarser particles of material which have traversed said vortex and are gravitationally held in said zone are centrifugally thrown back into said vortex and subjected thereby to its grinding energy until the same have been reduced in size by attrition in said zone and so are sufficiently lightened in weight to be lifted out of said zone against the force of gravity for discharge solely from the upper region of the grinding chamber together with the exhausting stream of said gaseous vortex radially inward across the top end of said baffle member into said discharge outlet.

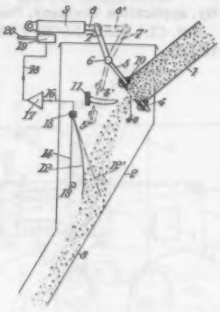
4,056,234

METERING DEVICE FOR A POWDERY MATERIAL

Christian Carré, Houilles, France, and Claude Rounuli, Vlissingen, Netherlands, assignors to Air-Industrie, Courbevoie, France

Filed Nov. 7, 1975, Ser. No. 629,929
Claims priority, application France, Nov. 14, 1974, 74.37566
Int. Cl.[2] B65B 1/06
U.S. Cl. 141—392 5 Claims

1. Declogging device for a duct in which normally flows a powdery material, said duct being provided at its outlet with a removable diaphragm comprising an orifice determining a normal flow rate of the material, said declogging device comprising: a flow detector for sensing the flow rate of the material and supplying at its output a signal when the rate of flow of said material is under or reaches a predetermined threshold lower than said normal flow rate, consequent upon partial or total obstruction of said orifice; a clearing pin; and actuating



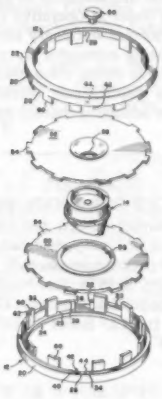
means connected to said output of the flow detector for causing said clearing pin to be engaged in said orifice of the diaphragm and to clear the latter when receiving said signal.

4,056,235

BEZEL CASE

Alfred W. Roe, Bellport, N.Y.; John Ogden, Rayleigh, England, and Robert Carter, Shoreham, N.Y., assignors to Roe International, Inc., Patchogue, N.Y.

Filed Nov. 19, 1976, Ser. No. 743,524
Int. Cl.[2] B65D 11/10; G01B 3/08
U.S. Cl. 220—4 E 18 Claims



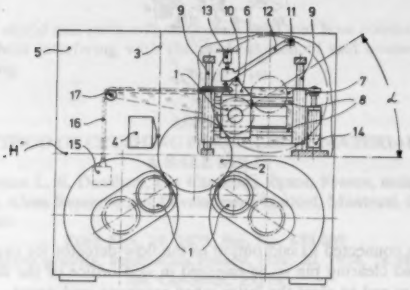
12. A tape reel case comprising a pair of substantially identical case elements each of which comprises a peripheral wall having first and second edge portions and an inwardly extending wall portion integral with said second edge portion; said first edge portion of said peripheral wall having a tape discharge slot formed therein extending from the first edge portion toward the second edge portion thereof and having a predetermined length; said case elements each including a plurality of identically located peripherally spaced fingers extending from said inwardly extending wall portion parallel to said peripheral wall portion to free ends located above said first edge portion of the wall whereby said fingers on said case elements interdigitate when the elements are superimposed with said first edge portions in engagement.

4,056,236

MACHINE FOR WINDING TEXTILE THREADS

Günter Jährig, Leopoldshafen, Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Germany

Filed Nov. 1, 1976, Ser. No. 737,340
Claims priority, application Germany, Nov. 4, 1975, 2549254
Int. Cl.[2] B65H *54/20, 17/08*
U.S. Cl. 242—18 DD 5 Claims



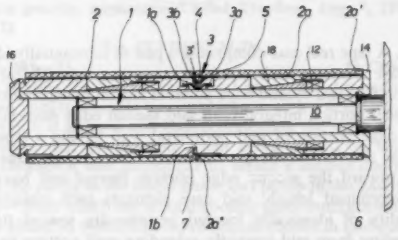
1. A machine for winding textile threads into a ball, comprising a drive cylinder, means for supporting at least one bobbin holder on the circumference of said drive cylinder comprising a receiver having means for rotatably supporting a bobbin holder thereon, a horizontal guide along which said receiver is movable, biasing means biasing said receiver in a direction to urge the bobbin holder which receives the ball against the drive cylinder for rotation thereby, said receiver being continuously displaceable along said guide with increased ball volume, a swivel guide bar pivotally mounted adjacent said guide and being inclined relative to the horizontal for pivotal movement in one direction and performing a slight pivotal movement in the horizontal displacement of said receiver, said receiver having a first feeler in operative connection with said swivel guide bar, a second stationary feeler located adjacent said guide bar and being actuatable by pivotal movement of said guide bar, and drive means connected to said receiver for effecting the vertical displacement thereof and connected to said second feeler for actuation thereof upon actuation of said second feeler.

4,056,237

SPACER FOR SPOOL TUBES

Harry B. Miller, Charlotte, N.C., and Günter Jährig, Eggenstein-Leopoldshafen, Germany, assignors to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Germany

Filed Oct. 5, 1976, Ser. No. 729,817
Claims priority, application Germany, Oct. 8, 1975, 7531948
Int. Cl.[2] B65H *54/00*
U.S. Cl. 242—18 PW 6 Claims



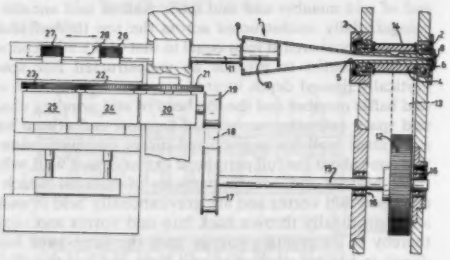
1. A device for the axial spacing of spool tubes along a common spool carrier, comprising a rotatable cylindrical spool carrier having a periphery with a recess therein intermediate the length of said spool and having an unobstructed end and an opposite end with a projecting stop, first and second spool tubes of substantially the same length and internal diameter being engageable onto the unobstructed end and over the periphery of said spool carrier with the first spool abutting against said stop and with the two tubes being arrangeable in end-to-end relationship on said spool carrier, spool tube spacing means located in the recess on the periphery of said spool carrier and being movable by engagement of said first spool as it is moved over the periphery of said spool carrier to abut against said top to prevent movement of said second spool into abutting engagement with said first spool and effectively spacing said second tube axially away from said first tube, and thread-catching means on said spool located between said spool tubes for catching the thread to be spooled, said spool tube spacing means comprising an angle lever pivotally mounted in said recess for movement in an axial direction, said angle lever being of a V-shape configuration and including first and second interconnected leg portions which are flattened at their connections.

4,056,238

APPARATUS AND A METHOD OF WINDING FILAMENTARY MATERIAL

Alexander J. Ciniglio, Brentwood, and Richard M. Hadfield, London, both of England, assignors to Rotawinder Limited, Ilford, England

Filed Dec. 23, 1975, Ser. No. 643,799
Claims priority, application United Kingdom, Jan. 30, 1975, 4186/75; July 24, 1975, 31074/75
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—25 R 9 Claims

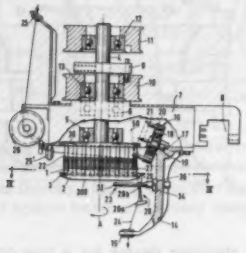


1. For winding a filament about a bobbin or like former, a fly winder having a rotatable axially stationary hollow flier and a rotationally stationary bobbin support concentric with the hollow flier and axially reciprocable towards and away therefrom, wherein the hollow interior of the flier is a surface of rotation symmetrical about the axis of rotation of the flier forming a filament guide surface adapted to restrain outward radial movement of the filament, said surface of rotation increasing in diameter substantially smoothly along its length from an axially directed filament inlet guide closely circumscribing said axis at substantially the apex of said surface of rotation, the greater diameter end of the hollow interior being disposed adjacent to the bobbin support and being of diameter such that a bobbin or like former mounted on the support can be received therein, filament guide means being disposed at or adjacent to the greater diameter end and through which the filament is to be constrained to pass before being wound on the bobbin or like former with the filament having freedom of circumferential movement intermediate the filament inlet and the filament guide means.

4,056,239
YARN SUPPLY APPARATUS FOR POSITIVE THREAD SUPPLY

Josef Fecker, Steinhofen-Bisingen, and Gustav Memminger, Freudenstadt, both of Germany, assignors to Firma Gustav Memminger Verfahrenstechnik fur die Maschenindustrie, Freudenstadt, Germany

Filed Dec. 19, 1975, Ser. No. 642,605
Claims priority, application Germany, Oct. 4, 1975, 2544495
Int. Cl.[2] B65H *51/20*
U.S. Cl. 242—47.01 11 Claims

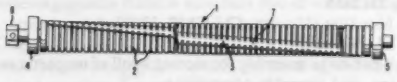


1. Thread supply apparatus for positive thread supply, for use with textile machines, comprising
a support frame (8, 14);
a rotatable yarn supply storage drum (1) journalled in the support frame for rotation in a clockwise or counterclockwise direction.
means supplying yarn to said drum (1) to form a stack of supply windings (27) thereon, the yarn being drawn off over the end of the drum from a pull-off position;
a thread break sensor (28) in the path of the yarn and engaged thereby;
a depending arm (14) extending from said frame and adjacent said drum and stationary thread guide means (15) at the end thereof beneath the drum and offset from the axis of the drum;
and a thread guide element (23) including a pin-like finger (33) which is located below the drum (1) in the path of the thread adjacent the pull-off position, and upwardly of the thread guide means (15) and extends in a direction substantially parallel and laterally offset, with respect to a plane containing the axis of rotation of the drum and said guide means (15).

4,056,240
YARN GUIDE

John Battista Gallini; Gerald Dean Hauxwell, and Christopher Roger Whitfield, all of Richmond, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,060
Int. Cl.[2] B65H *57/16, 57/04;* D01H *13/04*
U.S. Cl. 242—47.09 4 Claims

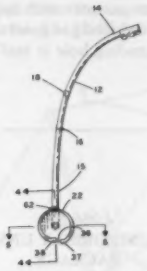


1. A yarn guide comprising a rotatably mounted circumferentially grooved cylindrical bar having as part of the bar surface a smoothly recessed, relatively flat area advancing helically less than a complete turn along the length of the bar, the relatively flat area being uniformly recessed to a depth such that at least part of the recessed area is devoid of grooves.

4,056,241
HOSE ROLLING DEVICE

Patrick D. Yates, 23668 Ave. 17, Madera, Calif. 93637

Filed Apr. 14, 1976, Ser. No. 676,735
Int. Cl.[2] B65H *75/40*
U.S. Cl. 242—86.4 7 Claims

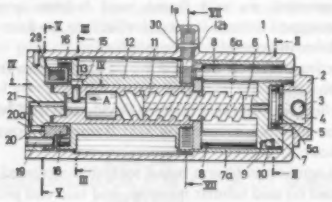


1. A hose rolling device comprising:
an elongated rigid handle disposable in a generally vertical position;
hand grip means at the upper end of said handle;
a drum rotatably mounted at the lower end of said handle, said drum having means for releasably anchoring one end of a linearly disposed section of hose for rotation with said drum with the surface of said drum aligned to rotatably pass over the balance of said hose, and being rotatably movable by said handle to roll along the balance of said hose and coil the same about said surface.

4,056,242
REEL FOR WINDING UP SAFETY BELTS

Güenter Herrmann, Munich, Germany, assignor to Bayern-Chemie Gesellschaft for flugchemische Antrieve mit beschrankter Aschau, Germany

Filed Sept. 3, 1975, Ser. No. 609,933
Claims priority, application Germany, Sept. 6, 1974, 2442744
Int. Cl.[2] A62B *35/00;* B65H *75/48*
U.S. Cl. 242—107.4 R 11 Claims



1. In a reel for winding up safety belts in vehicles having a housing with a chamber therein, a threaded spindle axially slideably supported in said housing and having piston-shaped head means thereon slideably engaging the walls of said chamber in said housing, a threaded nut member rotatably supported in said housing and threadedly engaging said thread on said spindle, an axial movement of said spindle effecting a rotation of said nut member, a winch mounted for rotation in said housing and relative to said nut member, said belt being wound onto said winch, a return spring connected between said housing and said winch to resiliently urge said winch in a first direction to wind up said belt thereon, pyrotechnically produced gas generating means in said chamber and on one side of said piston-shaped head means for effecting, upon a firing thereof in response to an impact of said vehicle with another object, a driving of said spindle in a first axial direction to rotate said nut member and inertia block means for locking said

winch against rotation in response to a braking of said vehicle at a rate in excess of a predefined normal braking rate, the improvement comprising at least one pin for connecting said nut member to said winch in response to the generation of gas caused by a firing of said pyrotechnically produced gas generating means, said pin being mounted in a hole in said nut member and said hole communicates with said chamber in which said pyrotechnically produced gas generating means is located through an axially extending hole in said spindle.

4,056,243

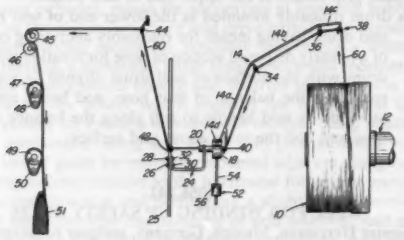
APPARATUS FOR UNIFORMLY UNWINDING A YARN PACKAGE

Luc Andre Bilodeau, St. Jean, Canada, assignor to Celanese Canada Limited, Montreal, Canada

Filed Apr. 2, 1976, Ser. No. 673,189

Int. Cl.[2] B65H *49/00*

U.S. Cl. 242—128 **7 Claims**



1. An apparatus for smoothly and regularly unwinding a yarn wrapped around the exterior face of a bobbin, said apparatus comprising:

a. a frame for supporting bobbins of yarn

b. a bobbin of yarn rigidly and substantially horizontally mounted on said frame, said bobbin containing yarn wrapped around its exterior surface, so as to be unwound from the outside of the bobbin,

c. a yarn take-up device for pulling the yarn from said bobbin, and

d. therebetween said take-up device and said bobbin, a tubular member secured on said frame and coaxial with said bobbin,

e. a semi-arcuate arm being rotatably mounted, near its first end on said tubular member, and said end provided with a counter-balanced weight, the other end terminating at a distance short of the yarn wrapped around the bobbin and ending substantially half-way along the length of the bobbin, said arm being substantially frictionless upon rotation for its easy spinning and being provided with a yarn passage from near said other end to near said first end, said yarn passage co-operating with said tubular member defining a second yarn passage, with said yarn take-up device and with said bobbin to simultaneously radially support and displace the yarn from outside of the bobbin and to convey said yarn to said yarn take-up device via said yarn passages, while simultaneously converting the motion of the yarn from rotational into translational, and by the free rotation of the arm dampening of abrupt motions of the yarn leaving the bobbin, thereby reducing yarn breakage, the rotation of said arm being solely obtained by the force exerted on the yarn by said take-up device.

4,056,244

TAPE CLAMPING DEVICE FOR TAPE-CONTAINING CASSETTES

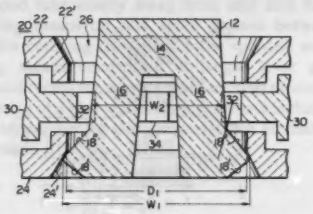
Nobuaki Matsutsuka, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 13, 1976, Ser. No. 676,491

Claims priority, application Japan, Apr. 16, 1975, 50-50533[U]

Int. Cl.[2] G03B *1/04*; G11B *15/32, 23/04*; B65D *85/672*

U.S. Cl. 242—197 **8 Claims**



1. A tape clamping device for a tape-containing cassette having a cassette housing with a pair of identical openings extending through the housing, a pair of reel hubs each having an aperture rotatably mounted within the housing coaxial with each of said openings and having a plurality of teeth extending inwardly from the inner wall of the aperture and adapted to mesh in use with a driving means provided in a tape recording and reproducing apparatus, the device comprising a plate-like member and a pair of laterally spaced limbs connected at one end to said plate-like member and extending substantially at right angles to the plane of said plate-like member and insertable through a space between adjacent ones of said teeth of one of said hubs and into one of said openings and removable therefrom, the longitudinal dimension of said limbs being substantially equal to the axial dimension of said one opening of the cassette housing, and the transverse dimensions of said limbs at the forward end thereof being slightly greater than the cross-sectional dimension of said one opening and at a portion intermediate their ends being slightly greater than a cross-sectional dimension defined by a locus of the inner end of said teeth by rotation of the hub and smaller than the cross-sectional dimension of said aperture of the hub, said limbs being capable of bending slightly toward each other upon insertion into said one opening and restoring to the original condition upon removal therefrom, whereby the intermediate portion of the limbs is disposed between adjacent ones of said teeth while the forward ends of the limbs engage the rear end portion of said one opening when the limbs are fully inserted thereinto.

4,056,245

MAGNETIC TAPE CARTRIDGE

Klaus Schoettle, Heidelberg; Heinrich Wittkamp, Mannheim, and Lothar Gliniorz, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Dec. 4, 1975, Ser. No. 637,780

Claims priority, application Germany, Dec. 7, 1974; Mar. 21, 1975, 2512455

Int. Cl.[2] G11B *23/02*

U.S. Cl. 242—197 **4 Claims**

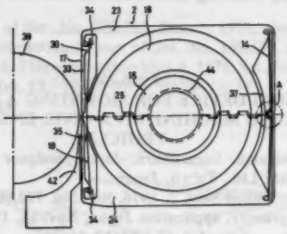
1. A cartridge assembly for storing a roll of magnetic recording tape, said assembly comprising:

an enclosure housing consisting of a pair of pivotal hollow boxes having corresponding open sides;

a pair of inward projections formed on the rear wall of said hollow boxes about which said hollow boxes pivot;

a spring means for hinging said hollow boxes together along their corresponding open sides and for urging said hollow boxes together in a normally closed position;

said spring means comprising a two-armed closing spring, a portion of one of said arms engaging one of said hollow boxes and a portion of the other of said arms engaging the other of said hollow boxes;



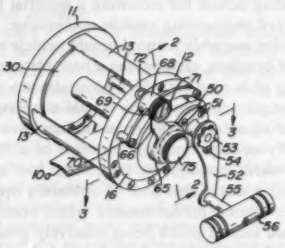
said spring means further having a central portion which embraces said projections formed on the rear wall of said hollow boxes thereby keeping them bearing against each other as said hollow boxes are pivoted open.

4,056,246

FISHING REEL WITH FRICTION DRAG

William Purcell, Philadelphia, Pa., assignor to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa.

Filed Dec. 13, 1976, Ser. No. 750,242
Int. Cl.[2] A01K *89/00*
U.S. Cl. 242—219 **9 Claims**



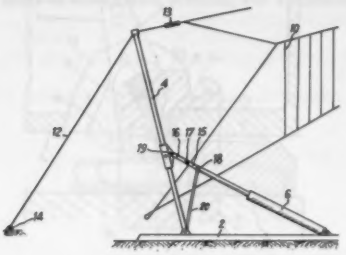
1. A fishing reel having spaced side housing members,
a spool interposed between said housing members,
a spool shaft journaled at one end in one of said housing members and to which said spool is secured,
said spool at its other end being journaled in said other housing member,
means for rotating said spool in one direction comprising
an exteriorly accessible manually operable crank member,
a gear movable along said spool shaft and driven by said crank member,
interengageable friction members one of which is on said spool and the other of which is movable with said gear, and
means for controlling free spool operation of said spool,
said last mentioned means comprising
spring means for urging said interengageable members to out of engagement position,
a brake control lever exteriorly disposed on said other housing member for manual manipulation,
mounting members for said lever one of which is in threaded engagement with the other for applying a force in opposition to said spring force.

4,056,247

AIRCRAFT ARRESTING GEAR NET RAISING DEVICE

Jean Paul Bernard, Paris, and Paul A. Meningand, Clamart, both of France, assignors to Aerazur Constructions Aeronautiques, France

Filed Aug. 4, 1976, Ser. No. 711,661
Claims priority, application France, Aug. 5, 1975, 75.24372
Int. Cl.[2] B64F *1/02*
U.S. Cl. 244—110 C **3 Claims**



1. An aircraft arresting gear, for disposal across a runway having a center line, comprising:
i. a pair of frame structures having a first end and a second end, said frame structures being intended for anchoring to the ground one at each side of the runway and obliquely to the center line of the runway
ii. a pair of posts associated one with each of said frame structures, said posts each having a top end and a bottom end, each post being pivoted at its bottom end to its associated frame structure at the first end thereof
iii. a rope connected to the top end of each post and disposed across the runway
iv. a net disposed across the runway and connected along said rope
v. a pair of pneumatically-operable piston-and-cylinder rams associated one with each of said frame structures, said ram being pivotably connected to the frame structure at the second end of the frame structure
vi. a pair of connecting means each connecting a respective ram to a respective post, each connecting means having:
a. a lever pivoted to the frame structure and the ram
b. a pair of links pivotally connected end-to-end, one end of said pair of links being pivotally connected to the point of connection of the ram and lever, the other end of said pair of links being pivotally connected to said post intermediate its top and bottom ends.

4,056,248

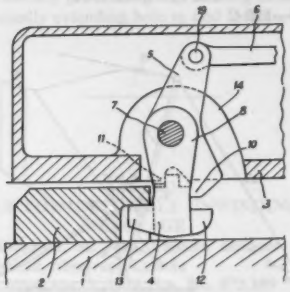
TWO-PURPOSE HOOK FOR AIRCRAFT LOAD CARRIERS

Jean H. Hasquenoph, Lagny-sur-Marne, and Pierre Fernand Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed July 1, 1976, Ser. No. 701,708
Claims priority, application France, July 1, 1975, 75.20577
Int. Cl.[2] B64D *1/02*
U.S. Cl. 244—137 R **3 Claims**

1. In a system for securing, under an aircraft, a jettisonable load having selectively a suspension ring and a suspension bridge with laterally spaced recesses, in combination:
i. a carrier structure, for mounting on the aircraft, including a horizontal transverse pivot pin releasably engaged therein,
ii. a shank having a first end and a second end, said first end being freely rotatably journalled on said carrier structure, said second end being adapted for connection to means for moving the shank angularly into a holding position and into a releasing position,
iii. a hook member having a first end and a second end, said

first end being freely rotatably journalled on said pivot pin, said second end having thereon a single element projecting in a radial plane from one side of the hook member and adapted for engagement in a suspension ring, said second end having thereon a pair of axially spaced



abutments projecting in a radial plane from the opposite side of the hook member and adapted for engagement in the laterally spaced recesses of a suspension bridge,

said shank and said hook member having portions abutting such that said shank and said hook member are coupled for angular movement about the axis of the pivot pin.

4,056,249

ENGINE MOUNTING APPARATUS

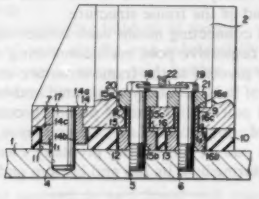
Masaharu Hashimoto, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed June 24, 1976, Ser. No. 699,580

Claims priority, application Japan, June 25, 1975, 50-87285[U]

Int. Cl.² F16F *15/00*

U.S. Cl. 248—9 **4 Claims**



1. An engine mounting apparatus comprising a base frame having first, second and third holes formed therein;

a bracket for the engine mounted on said base frame, said bracket having first, second and third holes formed therein corresponding to said holes in said base frame;

a cushion rubber disposed between said base frame and said bracket said cushion rubber having first, second and third holes formed therein corresponding to said holes in said base frame, diameters of said holes in said cushion rubber being larger than those of the corresponding holes in said bracket;

a first bush having small and large diameter portions disposed in said first holes formed in said bracket and said cushion rubber; second and third bushes having small and large diameter portions with a shoulder formed therebetween, said second and third bushes disposed in said second and third holes formed in said bracket and said cushion rubber respectively wherein a first gap is provided between said base frame and said first bush and a second gap is provided between said bracket and shoulder portion of said second and third bush respectively;

a pin adapted to be set in said first hole formed in said base frame through said first bush; and

bolt means disposed in said second and third holes formed in said base frame through said second and third bushes thereby fastening said bracket to said base frame.

4,056,250

COUPLING DEVICE FOR MOUNTING A MATERIAL HANDLING MACHINE ON A CIVIL ENGINEERING VEHICLE

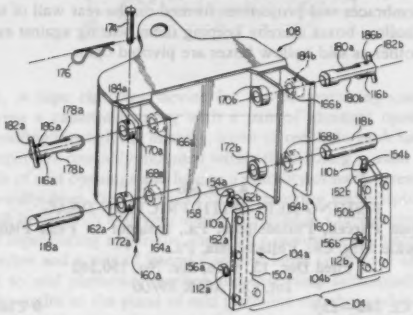
Kanji Uchiyama, Sagamihara, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Sept. 7, 1976, Ser. No. 720,861

Claims priority, application Japan, Nov. 18, 1975, 50-137755

Int. Cl.² F16M *11/04*

U.S. Cl. 248—14 **2 Claims**



1. A coupling device for mounting a material handling machine on a civil engineering vehicle comprising:

a first bracket assembly secured to said vehicle and including a pair of brackets, each having a base plate member and a coupling plate member which protrudes at a right angle to said base plate member, each of said coupling plate members having an upper pin-receiving concave seat with an upwardly opening locking first slot of a first predetermined width continuous therewith, and a lower pin-receiving concave seat with an upwardly opening second slot of a second predetermined width continuous therewith, said second width being relatively greater than said first width, and said coupling plate members being spaced apart in a horizontal direction;

a second bracket assembly secured to said material handling machine, said bracket assembly including a base plate member and pair of coupling means which protrude at a right angle from the base plate member, said coupling means each being bifurcated into two parts of coupling plate members which are disposed in horizontally spaced relation to each other, said coupling plate members each having upper and lower pin-attaching holes positioned in corresponding relation to said upper and lower pin-receiving concave seats, respectively, of said first bracket assembly;

a pair of upper pins having recessed surface means formed thereon, thereby providing the pins with middle portions having reduced widths which are slightly smaller than the predetermined width of said locking slots, said upper pins being formed with handles and being adapted to be inserted through said upper pin-attaching holes in said coupling plate members of said second bracket assembly; and

lower pins having circular cross sections throughout the entire lengths thereof and adapted to be inserted into said lower pin-attaching holes in said coupling plate members of said second bracket assembly.

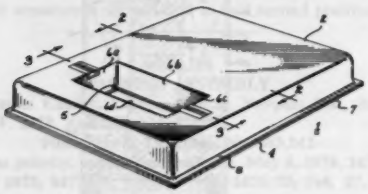
4,056,251
LIGHTWEIGHT PAD FOR SEMI-RIGIDLY SUPPORTING ELECTRICAL TRANSFORMERS

Jimmie D. Dixon, 7146 W. Bluefield, Peoria, Ariz. 85345, and Ralph C. McCannon, 3841 W. Vista Ave., Phoenix, Ariz. 85021

Continuation of Ser. No. 203,519, Dec. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 158,383, June 30, 1971, abandoned. This application May 6, 1976, Ser. No. 683,720

Int. Cl.[2] H02B 5/00; B65D 19/24

U.S. Cl. 248—19 **5 Claims**



1. A lightweight pad providing a semi-rigid vibration dampening support for maintaining an electrical transformer in spaced relation to a generally horizontal plane, said pad comprising in combination:

a. an integral, monolithic superstructure of synthetic, polymeric members, comprising:

i. a platform member for contactingly receiving said transformer;

ii. a base member parallel to said platform member, said base member having a plurality of spaced apertures therein;

iii. lateral wall members extending peripherally of said pad and enclosing the volume between said platform and said base member;

iv. a network of hollow, frusto-conical shaped members located between said lateral wall members and extending between said platform member and said base member, said frusto-conical shaped members tapering inwardly from said base member to said platform member and providing frusto-conical-shaped cells having open bases defined by the apertures in said base member and tops defined by, and integral with, said platform member; all of said members cooperating to define an internally disposed volume; said network of frusto-conical shaped members being substantially regular in pattern;

v. a transversely extending channel having opposing endwise openings through said base and said platform members to provide physical access between said transformer and said horizontal plane;

b. low density filler material substantially filling said internally disposed volume; and,

c. means for connectively receiving said electrical transformer in secured relation to said pad.

4,056,252
STRAIN-RELIEF BUSHING FOR CABLES AND THE LIKE

Hans Simon, Bruchausener Strasse 11, D-5463 Unkel (Rhine), Germany

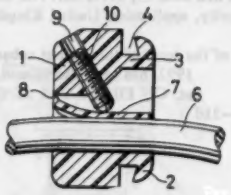
Filed Apr. 10, 1975, Ser. No. 567,114

Claims priority, application Germany, Jan. 20, 1975, 2502050

Int. Cl.[2] F16L 5/00

U.S. Cl. 248—56 **5 Claims**

1. A strain-relief bushing for a cable or the like extending through an opening in a wall of a casing and being subjected to a longitudinal tension force, said bushing comprising a circumferentially complete body of an uninterrupted cross-section having an internal axial passage therethrough, through which a cable is adapted to extend and having an internal wall extending through said passage substantially parallel to the axis thereof and being connected only at one end to the remainder of said body, said internal wall being of one piece with said body and being movable only in a direction transverse to said axis, said body having a pair of opposite circular groove portions on the outer surface thereof located in a substantially common plane in which parts of said casing wall about said opening are engaged, said body having a threaded bore extending therethrough and so arranged that its axis encloses an acute angle with said axis of said axial passage and intersects said common plane of said groove portions; and a threaded pressure-exerting element extending through said bore and exerting pressure against said internal wall at said acute angle relative to the same and in a direction against said tension force to thereby press said internal wall against the cable and to press thereby one of said groove portions into a corresponding portion of said casing wall about said opening, creating thereby a reaction force which presses the opposite groove portion likewise into a corresponding portion of said casing wall to thereby clamp the cable in said axial passage and said bushing in said opening in said casing wall.



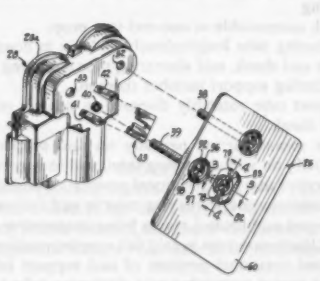
4,056,253
ADJUSTABLE MIRROR SUPPORT

Laszlo N. Repay, Chagrin Falls, and Thomas A. Young, Burton, both of Ohio, assignors to Tenna Corporation, Warrensville Heights, Ohio

Continuation-in-part of Ser. No. 470,569, May 16, 1974, Pat. No. 3,972,597. This application July 27, 1976, Ser. No. 709,161

Int. Cl.[2] A47G 1/24

U.S. Cl. 248—479 **14 Claims**



1. A one piece back for supporting a mirror for pivotable adjustment relative to a support, said back having a plate portion and as an integral part thereof a central mounting stud, two screws, and means integral with the plate portion connecting each said stud and screws at one end thereof to the plate portion for universal pivoting, each said connecting means comprising (a) a first portion substantially rigid, received within an aperture of the plate portion and spaced from the periphery of the aperture, (b) first and second web portions on diametrically opposite sides of said first portion, between the first portion and the plate portion, rigid in the direction of plate thickness but each flexible about a common axis in the plane of said portion, and (c) a third web portion rigid in the direction of plate thickness and flexible about an axis parallel to the plane

of said plate portion and perpendicular to said common axis, extending transversely of and located between said first and second web portions, at least partially surrounded by and integral with said first portion, and supporting the end of said respective stud or screw.

4,056,254

SUPPORTS OR CONCRETE FORMWORK

Jack Raymond Tooley, New Malden, England, assignor to Acrow (Engineers) Limited, London, England

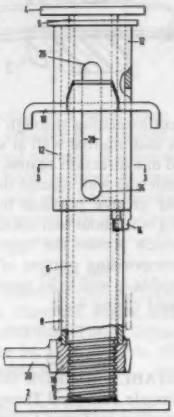
Filed Jan. 19, 1976, Ser. No. 650,449

Claims priority, application United Kingdom, Jan. 20, 1975, 2418/75

The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.

Int. Cl.[2] E04G *17/14, 25/06*

U.S. Cl. 249—210 **5 Claims**



1. A fitment for a prop, said fitment being adapted to support at least one shuttering element of the type used with concrete formwork, said fitment being adjustable between a full support position, and preliminary and full strip positions, said fitment comprising

a shank connectable at one end to a prop,

a shuttering tube longitudinally slidable in coaxial relation with said shank, said shuttering tube mounting at least one shuttering support member thereon,

a support tube rotatably disposed in coaxial relation with said shank,

locater means carried partially on said support tube and partially on said shuttering tube, said locater means being operative in a first rotational position of said support tube to maintain said shuttering tube in said full support position and said locater means being inoperative to maintain said shuttering tube in said full support position when in a second rotational position of said support tube, said locater means permitting said shuttering tube to drop into said full strip position when in said second rotational position, and

screw threads on said shank and said support tube and connecting said shank and said support tube together in threaded relation, rotation of said support tube relative to said shank while said locater means is in said first rotational position causing said shuttering tube to move between said full support position and said preliminary strip position in response to said threaded relation between said shank and said support tube, and rotation of said support tube relative to said shank which causes said locater means to move into said second rotational position also permitting said shuttering tube to drop into said full strip position in response to the inoperativeness of said locater means at said second rotational position.

4,056,255

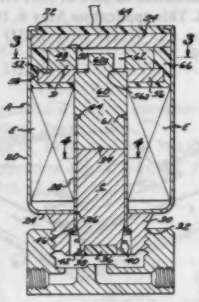
VALVE ACTUATOR

Donald A. Lace, 5041 Galway Circle, Huntington Beach, Calif. 92649

Filed May 8, 1975, Ser. No. 575,484

Int. Cl.[2] F16K *31/08*

U.S. Cl. 251—129 **8 Claims**



1. In combination with a valve body having an intermediate passage that has a valve seat therein, said valve body having a fluid inlet and fluid outlet that are at all times in communication with said intermediate passage and said valve seat respectively, a device operable from a source of electric power for controlling the flow of fluid through said valve body, which device includes:

a. a housing assembly that includes a cylindrical shell formed of a material having substantial magnetic permeability, said shell having a first open end and a second closed end that has an opening formed therein, a tubular guide having first and second ends, which guide is longitudinally aligned relative to said shell and extends through said opening, and first means for securing said housing assembly to said valve body with said guide being axially aligned with said valve seat;

b. an elongate armature having first and second ends, with said armature being slidably mounted in said guide, and said armature being formed from a ferro-magnetic material having substantial permeability and low retentivity;

c. a resilient valve member on said second end of said armature that sealingly engages said valve seat when in a first position and in pressure contact therewith;

d. second means that at all times exert a first force on said armature in a direction that tends to move said armature to said first position;

e. a solenoid in said housing that extends around at least a portion of said guide, with said solenoid being capable of energization from said source of electric power;

f. permanent magnet means of fixed polarity in said housing, said permanent magnet means adjacent said first end of said shell, said fixed polarity being such that the direction of the major portion of the magnetic flux from said permanent magnet means is through said shell and armature to tend to hold said armature in a second position where said valve member is spaced from said valve seat and fluid may flow from said inlet to said outlet, with said magnetic flux being of sufficient strength to overcome said first force exerted by said second means when said armature is in said second position but now when said armature is in said first position; said permanent magnet means including:

1. a permanent transversely magnetized ring having first and second side surfaces;

2. first and second plates of a material having substantial magnetic permeability that are in abutting contact with said first and second side surfaces of said ring, said first plate in abutting contact with the interior of said shell, said second plate defining an air gap with the interior surface of said shell; and

3. a core of material having substantial magnetic permeability that projects from said second plate into the interior of said solenoid;

g. third means for momentarily nullifying the flow of said magnetic flux through said shell and armature to permit said second means to move said armature to said first position; and

h. fourth means for electrically energizing said solenoid when said third means is not operating that said magnetic flux from said permanent magnet means and the magnetic flux from said solenoid concurrently flow through said armature in the same direction and exert a second force on said armature that is greater than said first force to move said armature from said first to said second position.

4,056,256

JACKING ASSEMBLY

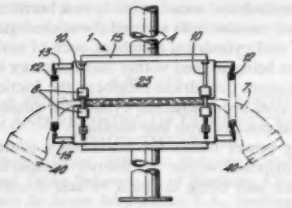
Jack Banks Caisley, Corner Pine & Newport Sts., Ballina, N.S.W. 2478, Australia

Filed May 4, 1976, Ser. No. 683,142

Claims priority, application Australia, May 5, 1975, 1474/75; May 5, 1975, 1477/75; May 5, 1975, 1475/75; Feb. 27, 1976, 5029/76

Int. Cl.² B66F *1/00*

U.S. Cl. 254—106 **17 Claims**



1. A fluid operated jacking assembly suitable for moving a load, in steps, axially of an elongated member the assembly comprising:-

two gripping parts adapted to be mounted at axially spaced positions on the member;

gripping devices mounted on each part and which grip the member in a way which allows relative axial movement in one direction only between the member and the parts;

fluid-pressure operated thrusting equipment for forcibly separating the two parts in response to the admission of a fluid under pressure to the equipment during a working stroke; and,

recovery means for forcing the two parts towards one another to execute a recovery stroke which follows the working stroke;

in which assembly said equipment comprises a flexible, inflatable, but non-elastic bag means shaped whereby, as it dilates, it progressively reduces its area of contact with the two parts in a way which causes the ratio of the jacking thrust to fluid pressure to diminish progressively as the two parts of the assembly move apart.

4,056,257

HOISTING TACKLE BLOCK ASSEMBLY

Howard E. Kaiser, P.O. Box 85, Kettle Falls, Wash. 99141

Filed Dec. 6, 1976, Ser. No. 747,720

Int. Cl.² B66D *1/36*

U.S. Cl. 254—194 **4 Claims**

1. A hoisting tackle block assembly, comprising:

a sheave shaft;

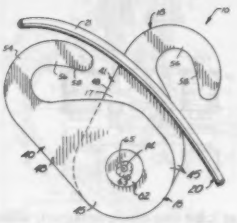
a sheave mounted on the shaft for rotation about the shaft axis;

a first housing member supporting one end of the shaft and extending upward along one side of the sheave and over the sheave and terminating in an upper end;

a second housing member supporting the other end of the shaft and extending upward along the other side of the sheave and over the sheave and terminating in an upper end;

said upper ends of the housing members having complementary, angularly alignable connecting means for enabling the assembly to be connected to a supporting structure;

wherein the upper ends of the first and second housing members have hook shaped segments; each segment having hook openings facing in the same rotational directions; and



said first and second housing members being rotatable about the shaft axis with respect to each other for movement between (1) an operating position in which the first and second housing members are angularly aligned with each other forming a rope enclosing housing transversely over the sheave with the complementary connecting means being angularly aligned for use in connection with a supporting structure, and (2) a rope loading and unloading position in which the first and second housing members are angularly displaced with respect to each other enabling a looped section of a rope to be easily mounted over or removed from the sheave.

4,056,258

ACTUATING DEVICE WITH ELECTRONIC CONTROL FOR INJECTORS OF LIQUID MIXERS

Paolo Papoff; Basilio Morelli, and Dante Guidarini, all of Bari, Italy, assignors to Centro Nazionale Delle Richerche, Rome, Italy

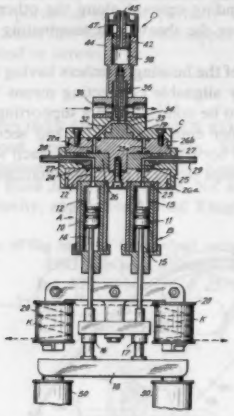
Continuation-in-part of Ser. No. 541,321, Jan. 15, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 749,391

Int. Cl.² B01F *15/00*

U.S. Cl. 366—160 **12 Claims**

1. A device for actuating injectors of liquid mixers of the type used in chemical/physical analysis, in particular according to the so-called stopped-flow method, for treating small amounts of the liquids in the range of a few cubic centimeters, comprising, in combination: dual injector devices having pistons that are operatively connected, by the intermediary of connecting means, the latter including a keeper of at least one electromagnet for simultaneous operation, while chambers of corresponding cylinders are selectively connectable, through a commutable intercepting member, with feeding conduits for

the liquids to be mixed, and with at least one mixing chamber; and electronic control means for feeding an electric supply



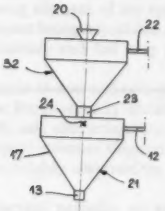
voltage to said at least one electromagnet, which voltage has a stepwise controllable value and duration.

4,056,259

PROCESS AND APPARATUS FOR THE CONTINUOUS PREPARATION OF A MIXTURE FOR FOUNDRY MOLDS OR THE LIKE, WITH FORMATION OF A PREMIX

Gerard Y. Richard, Precy sur Oise, France, assignor to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.-I.C., France

Filed Mar. 1, 1976, Ser. No. 662,806
Claims priority, application France, Mar. 3, 1975, 75.06564
Int. Cl.[2] B01F *7/16, 15/00, 15/02*
U.S. Cl. 366—15 **12 Claims**



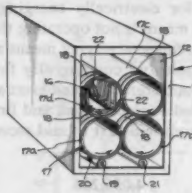
1. Apparatus useful for the malaxation of a charge and one constituent of the two constituents of a binder-hardener system to form a pre-mix followed by admixture of said pre-mix with the other constituent of said two constituents of said binder-hardener system, which apparatus comprises first malaxation means for forming a homogeneous pre-mix of said charge and said one constituent, second malaxation means embodying agitator means operable to obtain intimate and homogeneous admixture of said pre-mix and said other constituent within a few seconds followed by immediate evacuation of the resultant mixture from said second means, at least said second means being characterized by a mixing vessel having a cylindrical or conically tapered inner wall, a drive shaft extending coaxially in said vessel, a plurality of arms extending radially from said shaft, and a hammer on the radially outer end of each arm, said hammers respectively having a clearance with said inner wall, as they orbit upon rotation of said shaft, of only a few millimeters to provide thin film malaxation of the constituents of said resultant mixture.

4,056,260

ENVIRONMENTAL PLATELET AGITATOR

Melvin J. David, 16221 Quemada Road, Encino, Calif. 91314

Filed Oct. 4, 1976, Ser. No. 729,372
Int. Cl.[2] B01F *9/04*
U.S. Cl. 366—144 **10 Claims**



10. An environmental platelet solution agitator for use with platelet solution packets comprising:

a. an insulated enclosure having an interior compartment;

b. cooling means for maintaining the interior compartment of said enclosure at a predetermined temperature coupled to said enclosure;

c. cylindrical members having a cylindrical inner cavity and an outer cylindrical surface being disposed within the interior compartment of said housing, the longitudinal axis of said cylindrical member being in a horizontal plane;

d. frictional transfer belts secured about the outer surface of each of said cylindrical members, each of said cylindrical members being aligned within said enclosure in abuttment with adjacent cylindrical members, the frictional transfer belt secured about adjacent cylindrical members being in frictional contact with one another;

e. rotating power means for providing a source of rotary power disposed within the interior compartment of said enclosure and being coupled to said frictional transfer means;

f. platelet packet containers comprising a plurality of separator elements, each of said separator elements being substantially the same shape as said platelet packet, each of said separator elements being coupled in parallel spaced relation to each other, each pair of adjacent separator elements defining a cell therebetween for receiving a platelet packet, said coupling of said separator elements leaving an opening to each cell sufficient for insertion of a platelet packet, and further including cover means for closing the opening to the cell coupled to a terminating separator element of said container, each of said separator elements being disposed at a uniform oblique angle with respect to an axis directed along said coupled separator element, said platelet packet container being securely disposed within the interior cavity of respective ones of said cylindrical members; and

g. rotary power means for providing a source of rotary power disposed within the interior compartment of said interior enclosure and being coupled to said frictional transfer belts whereby said cylindrical members and said platelet packet containers are rotated at an angular velocity synchronious to said rotary power means.

4,056,261

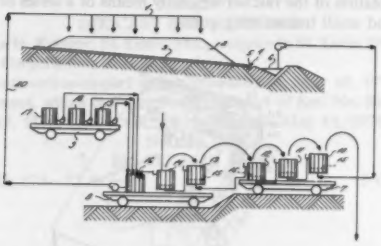
RECOVERY OF GOLD AND SILVER FROM MINE-RUN DUMPS OR CRUSHED ORES USING A PORTABLE ION-EXCHANGE CARBON PLANT

Robert M. Darrah, P.O. Box "5", Cool, Calif. 95614

Filed Feb. 17, 1976, Ser. No. 658,551
Int. Cl.[2] C22B *3/02*
U.S. Cl. 266—101 **4 Claims**

1. System for recovering at least one of gold and silver from mine run dumps or crushed ores containing at least one of gold and silver, comprising an inclined surface for supporting a heap of the mine-run dumps or crushed ores, means for distrib-

uting an alkali and cyanide containing aqueous solution onto the heap, a storage zone for the resulting pregnant solution arranged to collect the run-off of the solution from the inclined surface, a plurality of activated carbon loaded ion exchange vessels mounted on mobile support means, the activated carbon being supported on a punchplate distributor in each of the



vessels, conduit means for feeding the pregnant solution upwardly through the punchplate distributor supporting the activated carbon, the upward velocity of the solution maintaining the carbon in a teetered state and serially feeding the pregnant solution through the vessels thereby to strip the gold and silver values from the solution, and conduit means for recycling resulting barren solution for distribution onto the heap.

4,056,262

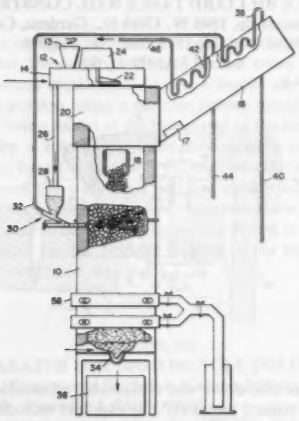
CUPOLA FURNACE TO ENABLE CONTINUOUS SMELTING AND REFINING OF CEMENT COPPER AND METHOD THEREFOR

Douglas Pollock; Omar Sobarzo; Rolando Urquizar; Carlos Vilches, and Jaime Bolanos, all of Santiago, Chile, assignors to Compania de Acero del Pacifico S.A., Santiago, Chile

Filed June 28, 1976, Ser. No. 700,217

Int. Cl.[2] C22B *15/02*

U.S. Cl. 266—138 **8 Claims**



1. A shaft kiln comprising:

an upper gas chamber;

an intermediate stack zone including coke-charging means;

a lower hearth zone including air-injecting tuyeres;

charge preheating means utilizing sensible heat from said upper gas chamber;

pneumatic charge injecting means adapted to inject said preheated charge into said intermediate zone;

gas off-take means in communication with said gas chamber; and

heat exchange means within said off-take means.

4,056,263

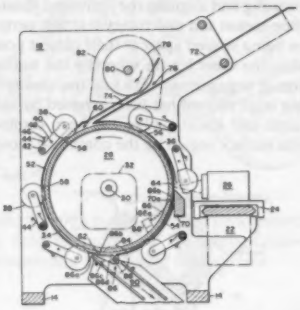
DRUMLESS PAPER TRANSPORTER

Eric L. LaWhite, South Royalton, Vt.; Ernest G. Henrichon, Jr., Wellesley Hills, and Harvey J. Bloom, Bellingham, both of Mass., assignors to Xicon Data Entry Corporation, Newton Upper Falls, Mass.

Continuation-in-part of Ser. No. 477,809, June 10, 1974, Pat. No. 3,941,375. This application Dec. 11, 1975, Ser. No. 639,802

Int. Cl.[2] B65H *9/16*

U.S. Cl. 271—3 **5 Claims**



1. A transporter of a sheet of paper for use in conjunction with an optical character reader having a pick-up head that translates along a first direction, comprising in combination,

a hub rotatable about its central longitudinal axis and extending along said axis for a distance substantially less than the length of the sheet, said axis being aligned in said first direction,

a reference edge located proximate one end of said hub lying in a plane substantially transverse to said axis,

means for rotating said hub,

a plurality of rollers that engage the periphery of said hub and hold the sheet on said periphery, said rollers being canted towards said reference edge in the direction of said rotation to dynamically adjust the sheet, said hub, rollers and reference edge cooperating to hold the sheet in a spaced relationship with said pick-up head as it rotates, supported on said hub, along a generally cylindrical path,

a plurality of guards spaced closely from the periphery of said hub and substantially encircling the sheet at least in the region about said hub to maintain the sheet in said generally cylindrical path as it rotates on the hub, said guards being spaced from one another to form input and output slots and a viewing slot that each extend in said first direction, and

a flexible brush located interior to said cylindrical path having a free edge extending in said first direction and proximate said viewing slot, said free edge engaging the surface of said sheet opposite said pick-up head to control said spacing between said pick-up head and said sheet along the length of said paper in said first direction.

4,056,264

STACK FORMING DEVICE

Alfons Leon Dhooge, Zwijndrecht, and Joseph Marie Cappuyns, Berchem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 26, 1976, Ser. No. 680,370

Claims priority, application United Kingdom, Apr. 28, 1975, 17566/75

Int. Cl.[2] B65H *29/22, 29/24*

U.S. Cl. 271—177 **6 Claims**

1. A sheet stacking device for stacking a plurality of sheets delivered in sequence, comprising

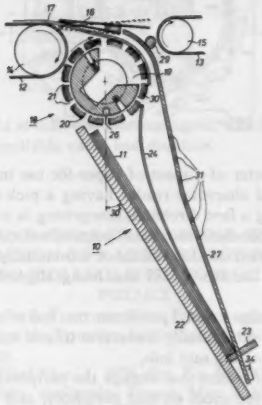
a stack supporting platform,

a driven substantially continuous traction surface having an

arcuate peripheral region disposed above one end of said platform with the lower side thereof proximate to said platform, said traction surface being aligned to engagingly contact the under face of a sheet to be stacked and by its movement to positively propel the sheet forward in a delivery direction,

delivery means for delivering a sheet to be stacked to a point on a portion of said arcuate peripheral region of said traction surface generally opposite said platform end,

stop means at the other end of said stack supporting platform for arresting and aligning the delivered sheets into a stack, said stop means and said rotary traction peripheral surface region being spaced apart at their closest points a distance less than the sheet length whereby the trailing sheet edge remains in engagement with said traction surface after the leading edge thereof has been arrested by said stop means and until said trailing edge has been displaced past said traction surface region by the continued movement of said



traction surface to thereby positively propel said trailing sheet edge against said stack,

guide means defining a delivery passageway with said generally opposite portion of said traction surface peripheral region and extending in spaced relation to said platform to a point at least adjacent said stack stop means, said guide means comprising an array of discrete elongated hollow members each extending with its length generally parallel to the sheet delivery direction, the individual members being spaced apart at plural points transverse of the sheet delivery direction, said hollow members having holes facing toward said stack for transmitting air under pressure toward said platform to bias a sheet being propelled by said traction surface toward said platform, and

means adjacent the lower side of said traction surface peripheral region proximate said platform end for directing a flow of air generally in the direction of the surface of said sheet stack to cushion the delivery of an on-coming sheet onto said stack.

4,056,265

MACHINE FOR INDOOR RUNNING

Azuma Ide, 5-213 go, 33-ban, 2-chome, Takashimadaira, Itabashi, Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,219
Claims priority, application Japan, July 14, 1976, 51-83870
Int. Cl.[2] A63B *23/04*
U.S. Cl. 272—70 **1 Claim**

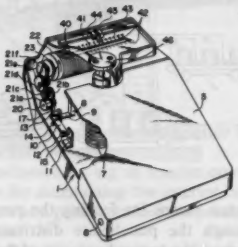
1. An indoor running machine comprising:

a machine body having a drum accommodating section formed at its front edge;

a vertically movable footboard provided on top of the body on the rear end side of said drum accommodating section and spring biased in the upward direction;

a ratchet gear provided within the body and means associated with said movable footboard and body adapted to rotate said ratchet gear pitch by pitch with the vertical movement of said footboard; and

a rotary drum provided within the drum accommodating section of the body and adapted to be coupled to the rotation of the ratchet wheel by means of a series of large and small transmitting gears,



the outer periphery of said rotary drum being provided with a colored indicating surface of increasing width from one end to the other end in the direction of the axis opposite to the direction of rotation,

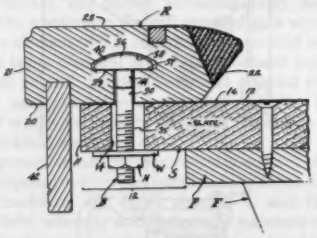
the top of said drum accommodating section positioned directly above said rotary drum being provided with an display window of a slit-like form along the axial direction of the rotary drum, said display window being provided with running distance indicating graduations permitting the rate of increase of the colored indicating surface appearing on the display window with the rotation of said rotary drum to be read out in terms of the rnning distance.

4,056,266

ADJUSTABLE BILLIARD TABLE RAIL CONSTRUCTION

Torben W. Gramstrup, 1946 W. 130th St., Gardena, Calif. 90249

Filed Dec. 24, 1975, Ser. No. 644,301
Int. Cl.[2] A63D *15/00*
U.S. Cl. 273—9 **7 Claims**



1. A hidden hold-down and replaceable adjustable rail construction for billiard tables and the like, and including; a platform with an overlying surface member having a marginal portion with openings therethrough, at least one replaceable rail shiftably engageable over said marginal portion and comprising an elongated member having an imperforate top and a flat bottom seated upon the surface member and with a channel longitudinally coextensive with and entering the bottom and having a lateral enlargement defining an upwardly faced seat longitudinally coextensive therewith, and hold-down bolts and each with a first member slideable into the channel to engage downwardly upon said seat and one bolt for positioned alignment within each of said openings in the surface member to extend through and project downwardly from the surface

member, said bolts having shanks substantially smaller in diameter than the size of any of said openings through said surface member for selective placement of the rail, there being a second member operable by each of the bolts to engage upwardly beneath said surface member to hold said placement of the rail.

4,056,267

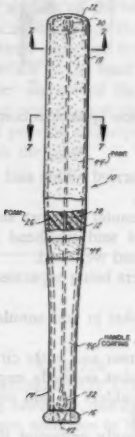
DIE CAST BAT WITH ROD

George H. Krieger, St. Louis, Mo., assignor to St. Louis Diecasting Corporation, Bridgeton, Mo.

Continuation-in-part of Ser. No. 468,815, May 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 549,701, Feb. 13, 1975, abandoned. This application May 11, 1976, Ser. No. 685,168

Int. Cl.[2] A63B *59/06*

U.S. Cl. 273—72 A 9 Claims



1. A die cast porous metal bat having a unitary skin and a foam center, the major portion of the bat being an elongated die cast porous metal blank having a handle and a barrel, the remaining portion being a die cast porous metal cap, the cap and blank being joined at the barrel end of the blank and fixed together by a substantially non-porous weld seam, the cap portion having a sleeve which projects into the interior of the blank beyond the weld seam and lies closely adjacent to the interior of the blank and reinforces the barrel end of the blank, the handle end of the bat having walls defining an opening into the interior of the bat, and the interior of the bat being filled with a resilient foam material.

4,056,268

APPARATUS FOR MOTORCYCLE POLO GAME

Thomas R. Connor, and Shirley A. Connor, both of 5626 Putnam Drive, W. Bloomfield, Mich. 48033

Continuation-in-part of Ser. No. 577,305, June 9, 1975, abandoned. This application Apr. 16, 1976, Ser. No. 677,578

Int. Cl.[2] A63B *71/02;* A63C *19/12;* B60K *41/20;* B62D *61/02*

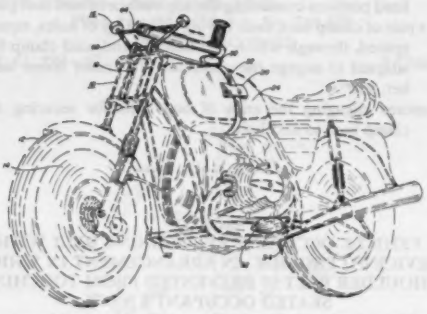
U.S. Cl. 273—118 R 5 Claims

1. Apparatus for motorcycle polo game comprising in combination:

a. center lever steering means mounted on a motorcycle's steering post for steering with one hand;

b. player stabilizer means fixed between a motorcycle's saddle and steering post for stabilizing player as he strikes at a ball;

c. feet operated control means operably connected to a motorcycle's motor and brakes for controlling said motorcycle's motion other than steering; and



d. cooperating traction means mounted on a motorcycle and a playing field for increasing the traction therebetween without destroying the playing field surface.

4,056,269

HOMOGENEOUS MOLDED GOLF BALL

Duncan H. Pollitt, Titusville, and Murray H. Reich, Princeton, both of N.J., assignors to Princeton Chemical Research, Inc., Princeton, N.J.

Filed May 4, 1972, Ser. No. 250,147

Int. Cl.[2] A63B *37/06;* C08F *279/02;* C08K *3/10, 5/09*

U.S. Cl. 273—218 12 Claims

1. In a homogeneous molded golf ball having the density and click and rebound required in a golf ball and comprising filled cis-polybutadiene elastomer highly cross-linked into a three dimensional network with long, flexible cross-links formed of a polymerized cross-linking monomer, the improvement wherein said cross-linking monomer comprises a polyvalent metal salt of an unsaturated acid and is present in about 0.046 to 0.41 equivalents per mole of elastomer base whereby said comonomer simultaneously functions as said filler at least in part, said ball in addition to said filler-functioning cross-linking monomer containing up to about 30 parts of a further filler per 100 parts by weight of said elastomer, the amount of said further filler being sufficient to impart to said golf ball a weight of about 1.500 to 1.620 ounces.

4,056,270

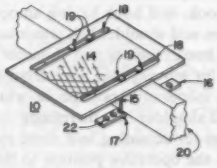
DEMOUNTABLE BOAT TRAILER STEP

Kenneth Greenfield, 2723 Hillcrest Lane, Caldwell, Idaho 83605

Filed July 2, 1976, Ser. No. 702,182

Int. Cl.[2] B60R *3/00*

U.S. Cl. 280—166 3 Claims



1. A demountable boat trailer step, which comprises:

a substantially rectangular foot plate having oppositely disposed planar surfaces, the bottom surface of said plate engaging the top surface of a boat trailer frame member, said plate having a pair of parallel slots extending substantially the full width of said plate and adapted to receive

bolts for allowing horizontally transverse movement of said plate relative to the frame member;

a plurality of bolts extending through the slots and having head portions contacting the top surface of said foot plate;

a pair of clamp bars, each having a plurality of holes, equally spaced, through which said bolts extend, said clamp bars adapted to engage the underside of a trailer frame member; and

means engaging the ends of said bolts for securing said clamp bars to said bolts.

4,056,271

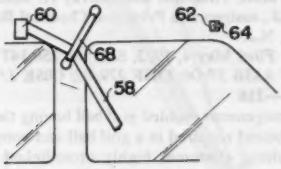
VEHICLE OCCUPANT RESTRAINING BELT WITH DEVICE TO PROVIDE AN ARRANGEMENT IN WHICH SHOULDER BELT IS PREVENTED FROM TOUCHING SEATED OCCUPANT'S NECK

Yoshihisa Imabuchi; Kenshi Kurami; Yoshinori Akiyama, and Katsunobu Sobajima, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 613,419, Sept. 15, 1975. This application Oct. 22, 1976, Ser. No. 734,886

Int. Cl.[2] B60R *21/02*

U.S. Cl. 280—745 **1 Claim**



1. In a vehicle having a vehicle body including a floor and a roof defining an occupant compartment in which is mounted a vehicle seat accessible through a vehicle door opening selectively opened and closed by a vehicle body door whose front edge is pivotally secured to the vehicle body;

an occupant restraining belt arrangement comprising:

a lap belt having one end fixed adjacent a lower inboard portion of the door;

a first inertia retractor mounted adjacent a lower inboard portion of the seat and receiving the other end of said lap belt;

a shoulder belt having one end secured to an intermediate portion of said lap belt between said one end and the other end thereof;

a second inertia retractor mounted on the roof within the occupant compartment adjacent an outboard upper rear portion of the seat;

a belt hanger fixedly mounted on the vehicle body within the occupant compartment forward and above the seat and having a hook, said hook having an operative position in which when said shoulder belt is manually hanged on said hook, said hook receives said shoulder belt;

drive means for moving said hook from the operative position to an inoperative position in which said hook will release said shoulder belt therefrom;

control means for actuating said drive means to move said hook from the operative position to the inoperative position upon closure of the door with the seat occupied; and

a channel member mounted to the roof within the occupant compartment, said channel member slidably receiving an intermediate portion of said shoulder belt, to provide an arrangement in which said shoulder belt extends diagonally across the chest of a seated occupant without touching the neck thereof when said shoulder belt is in its occupant restraining position.

4,056,272

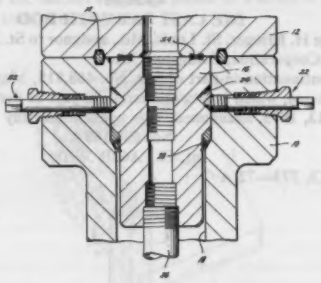
SEAL

Charles Donovan Morrill, 5003 Holly, Bellaire, Tex. 77401

Continuation-in-part of Ser. No. 447,141, March 1, 1974, abandoned. This application Sept. 10, 1975, Ser. No. 611,860

Int. Cl.[2] F16L *21/00*

U.S. Cl. 285—140 **15 Claims**



1. Well pipe suspension apparatus comprising:

a wellhead,

a well pipe,

pipe hanger means carried within said wellhead for supporting said well pipe,

opposing tapered annular support shoulders on said pipe hanger means and said wellhead supporting said pipe hanger means in said wellhead,

said support shoulders being separated forming an annular space,

an annular metal gasket in said annular space between said support shoulders,

said gasket having inner and outer circumferential edges,

one edge of said gasket sealingly engaging one of said tapered support shoulders of said pipe hanger means and said wellhead, and

the other edge sealingly engaging the other of said pipe hanger means and said wellhead.

4,056,273

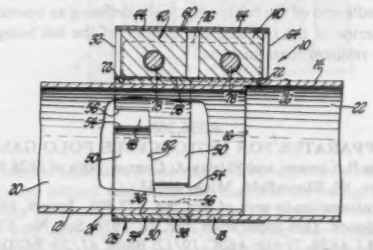
COUPLING FOR PIPE LAP JOINTS

Thomas R. Cassel, 226 Shirley, Birmingham, Mich. 48009

Filed Dec. 8, 1976, Ser. No. 748,423

Int. Cl.[2] F16L *21/06*

U.S. Cl. 285—337 **10 Claims**



1. A coupling for connecting and sealing inner and outer pipes having respective inner and outer surfaces and ends that lap each other at a joint where the inner pipe is received within the outer pipe in a telescoped relationship, the coupling comprising: a coupling band having a roundish sleeve portion extending about the pipe ends and a radially projecting channel portion connected to the sleeve portion and cooperating therewith in encircling the pipe ends while extending axially from the outer pipe end over the inner pipe; a seal ring received

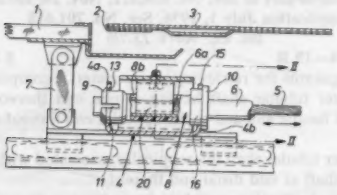
within the sleeve portion of the band so as to be adaptable to butt against the outer pipe end and having inner and outer surfaces for forming an axial continuation of the inner and outer surfaces on the outer pipe; first and second axially spaced reaction members received within the channel portion of the band in respective axial alignment with the outer pipe end and the seal ring; said reaction members having outer surfaces that respectively form circumferential continuations of the outer surfaces on the outer pipe end and the seal ring in a spaced relationship to the band channel portion; said band having an inner surface whose combined circumferential length about the sleeve and channel portions thereof is less than the combined circumferential length of the outer surface on the outer pipe end and the outer surface on the first reaction member; the combined circumferential length of the inner surface of the band about the sleeve and channel portions thereof also being less than the combined circumferential length of the ring outer surface and the outer surface on the second reaction member when the ring has the inner surface thereof engaged with the outer surface on the inner pipe; and force applying means for engaging the inner surface of the band at the channel portion thereof with the outer surface of the reaction members to stretch the band sleeve portion over the seal ring and the end of the outer pipe and provide a clamped relationship thereof that connects and seals the pipes.

4,056,274

VEHICLE SLIDING ROOF CONSTRUCTION

Hans Jardin, Krailling, Germany, and Jack Auzannet, Conflans Ste., Honorine, France, assignors to Webasto-Werk W. Baier KG, Germany

Filed Dec. 16, 1975, Ser. No. 641,283
Claims priority, application Germany, Dec. 21, 1974, 2461018
Int. Cl.² B60J 7/10
U.S. Cl. 296—137 G **13 Claims**



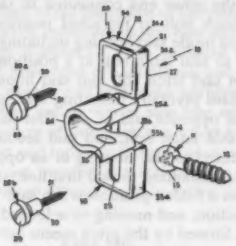
1. A vehicle sliding roof construction with a rigid sliding roof articulated to transport bridge, the bridge being U-shaped in cross-section, a driving cable rigid under compression slidably received or guided in a longitudinally slotted pipe mounted on the fixed roof portion, the pipe slidably receivable in the tubular body fixed to the transport bridge at least when the roof is in the open position, the tubular body comprising a longitudinally slotted plastic member which passes through the arms of the transport bridge, the tubular body having means securing the body to the said transport bridge so that the tubular body cannot rotate and become axially displaced, means fixing the driving cable to the transport bridge within the same comprising a clamping collar fixed on the cable and having cross bars projecting through and beyond the longitudinal slots of the pipe and of the tubular body.

4,056,275

CLOSURE CATCH ASSEMBLY

Miner S. Keeler, II, Grand Rapids, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.

Filed Aug. 30, 1976, Ser. No. 718,677
Int. Cl.² E05C 19/02
U.S. Cl. 292—17 **6 Claims**



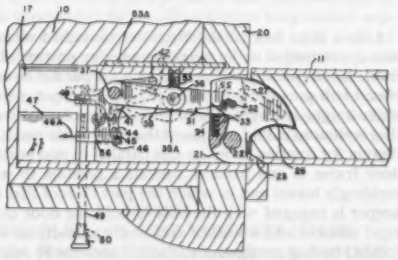
1. A fastener for a cabinet or the like, comprising:
an elongated strike component including a head portion and a threaded screw portion for mounting and adjusting the position of said head portion;
a catch component including a substantially flat, elongated base member having an elongated, longitudinal screw receiving slot extending through said base member, said base member having a flexible, screw engaging means surrounding the perimeter of said slot for providing a biasing force restraining longitudinal movement of said base member, and an integral catch member projecting substantially perpendicularly from said base member;
said catch member having a pair of opposing flanges extending forwardly from a connecting rearward portion thereby defining an interior cavity, intermediate said flanges and said rearward portion, opening through both sides of said catch member, for receiving said head portion of said elongated strike component; and
a mounting screw for passing through said screw receiving slot, said mounting screw having stop means for limiting travel of said mounting screw into the cabinet and slot engaging means for engaging said screw engaging means and thereby deforming the perimeter of said slot.

4,056,276

DOOR LOCK

Kenneth W. Jarvis, 5900 Columbus Ave. South, Minneapolis, Minn. 55417

Filed Apr. 5, 1976, Ser. No. 673,403
Int. Cl.² E05C 3/16
U.S. Cl. 292—201 **14 Claims**



1. A door lock device for use with a door frame member and movable door member comprising a housing mountable in one of said members, the other of said members having a receptacle in an edge adjacent said lock device, a latch bolt pivotally

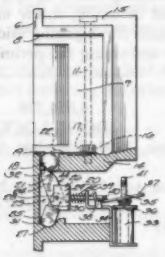
mounted to said housing about a generally upright axis when installed, said latch bolt being pivotally movable from a retracted position to a locked position, means associated with said latch bolt operable to cause pivoting of said latch bolt as a door to be latched is moved toward a closed position whereby portions of said latch bolt protrude from said housing and into the receptacle in said other member, an elongated tension coil spring means having one end connected to said housing and the other end connected to said latch bolt and urging said latch bolt to retracted position, toggle linkage means mounted inside said housing including a first link pivotally mounted to said latch bolt at a position spaced from the pivot between said latch bolt and said housing and a second link, pivot means pivotally mounting said second link to said first link at an opposite end of said first link from the pivot mounting to said latch bolt, and said second link also being pivotally mounted to said housing at an opposite end thereof from its pivotal mounting to said first link, said toggle linkage means being in a folded position when said latch bolt is in an unlatched position, and moving to a locked position wherein the pivot axis formed by the pivot means between the first and second links is generally adjacent to a plane defined by the pivots between the first link and the latch bolt and the second link and the housing to resist pivoting of said latch bolt from its latched to its unlatched position from loads on the latch bolt, and actuator means including an actuator member movable from a first position to a second position, and to exert a mechanical force on said toggle linkage means at a location between the pivot of the second link to the housing and the pivot of the first link to the latch bolt when the linkage is in locked position and to mechanically move said toggle linkage means toward folded position and permit the latch bolt to move to unlatched position.

4,056,277

ELECTRIC STRIKE

Abraham Gamus, Chomeday, and Zoran Knecevic, Montreal, both of Canada, assignors to Unican Security Systems, Ltd., Montreal, Canada

Filed Oct. 5, 1976, Ser. No. 729,647
Int. Cl.[2] E05C *19/16*
U.S. Cl. 292—341.16 **15 Claims**



1. In a door lock of the character described wherein a remotely controlled strike tongue in an edge portion of the door frame has a part thereof providing a keeper for an outwardly biased bolt projecting from an edge of the door, wherein said strike tongue is a rigid member located in a cavity in a housing that is secured in said portion of the door frame and is mounted therein for rotation about an axis parallel to said portion of the door frame to and from an operative position to which it is yieldingly biased and in which the part thereof that forms the keeper is engaged with the bolt to hold the door closed, said rigid member and a wall of said housing cavity in which it is located having contiguous surfaces transverse to said axis, that slide across one another during rotation of the rigid member, so that projection across the interface between said contiguous surfaces of a stop member mounted in the housing, into a socket in the rigid member that opens to its respective one of said contiguous surfaces while the rigid member is in its operative position, locks a closed door against unauthorized opening, the improvement which comprises:

A. the housing having

1. a passage leading from its said cavity to a mouth that opens to the interface between said contiguous surfaces at a point in line with said socket in the strike tongue when the latter is in its operative position, and

2. means providing a fulcrum substantially in line with and remote from said passage;

B. a toggle linkage having inner and outer legs pivotally connected by a knee joint, said toggle linkage being located in said cavity of the housing with the extremity of its inner leg supportingly engaged with said fulcrum and the extremity of its outer leg adjacent to said passage and movable towards and from the mouth thereof as the toggle linkage is respectively straightened and collapsed;

C. mean at the extremity of the outer leg of the toggle linkage providing said stop member and projecting across the interface between said contiguous surfaces into the socket in said rigid member when the toggle linkage is in a substantially straightened extended condition;

D. biasing means yieldingly urging the toggle linkage towards its straightened condition and in one direction beyond its dead center condition;

E. the interengaging surfaces of said socket and said means at the extremity of the outer leg of the toggle linkage being shaped to provide a wedging action that translates torque applied to said rigid member by opening force exerted upon the closed door into toggle collapsing force;

F. means defining a stop to support said toggle linkage in said slightly beyond dead center condition and thereby resist any collapsing force applied to the toggle linkage by the aforesaid wedging action; and

G. remotely actuatable means operatively connected with the knee joint of the toggle linkage for moving the same across dead center in the direction opposite to that in which said biasing means urges the same to thereby initiate collapse of the toggle linkage.

4,056,278

SCOOP DEVICE

Marcel Bau, 89 Van Ness Court; Larry D. Hinkes, 45 Van Ness Court, both of Maplewood, N.J. 07040, and James Cosgrave, 57 Norwood St., Newark, N.J. 07106

Continuation-in-part of Ser. No. 634,821, Nov. 24, 1975. This application July 1, 1976, Ser. No. 701,615
Int. Cl.[2] A47F *13/06*
U.S. Cl. 294—19 R **5 Claims**

1. An apparatus for retrieving waste material comprising:

a. an outer tubular shaft having at one end thereof a U-shaped handle end and at the opposite end thereof a distal end;

b. an inner tubular shaft telescopically associated within said outer shaft at said distal end thereof;

c. a hinged grasping member comprising a unitary base secured at one end thereof within the distal end of said inner shaft and at the other end thereof defining finger elements extending in their natural state in opposite directions to each other, said grasping member prepared from a resilient, flexible material, said finger elements adapted to flex toward each other to grasp and secure an open disposable litter receptacle during the placement of litter therein and to subsequently effect the closing of said receptacle;

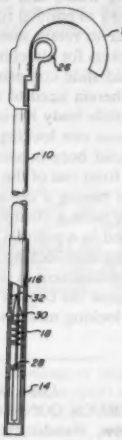
d. a trigger element rotatably secured to said handle end;

e. a connecting wire attached to said trigger and passing axially through the length of said outer shaft and said inner shaft, respectively, said connecting wire passing through an opening provided in said base and terminating between said fingers, said wire having its degree of tension controlled by the movement of said trigger element;

f. a ball element attached to said wire at its point of termina-

tion and emergence from said base, said ball element serving to pass through a corresponding opening in said litter receptacle to secure said receptacle in position between said fingers during the placement of said litter therewithin; and

g. a biasing element disposed about said wire and abuttingly disposed to said base, said biasing element serving to



accomplish a fine control of the closing of said fingers by said trigger,

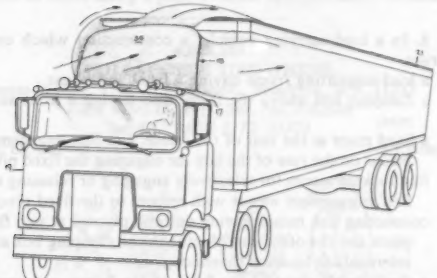
whereby longitudinal movement of said outer shaft toward said handle end will cause the release of said fingers into a naturally open opposed disposition for cooperation with said ball element to associate with an open, unused waste receptacle.

4,056,279

AIR DEFLECTOR FOR TRACTOR-TRAILER VEHICLE

Robert Eugene Dorsch, South Bend, Ind., assignor to Uniroyal, Inc., New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,553
Int. Cl.[2] B62D *35/00*
U.S. Cl. 296—1 S **15 Claims**



9. An air deflector suitable for mounting on the roof of a cab of a tractor of a tractor-trailer vehicle and providing a frontwardly facing air-deflecting surface for reducing air resistance to forward movement of the tractor-trailer vehicle, wherein the improvement comprises:

A. said air-deflecting surface is (1) symmetrical about a vertical center plane and has a central portion and a pair of lateral wing portions symmetrically located on opposite sides of said central portion, (2) is totally curved and forwardly convex in all its horizontal and vertical cross-sectional planes, and (3) in said central portion has a uniform radius of curvature in all horizontal and vertical cross-sectional planes;

B. said deflector has a top edge and a base edge;

C. the center of curvature of said central portion of said air-deflecting surface is located on a plane that is parallel to the plane of said base edge of said deflector and below the same, the perpendicular distance between said planes being the product of (a) the radius of curvature extending from said center of curvature to said base edge and (b) the sine of an angle of about 12° to 16° included between that radius and the lower one of said planes; and

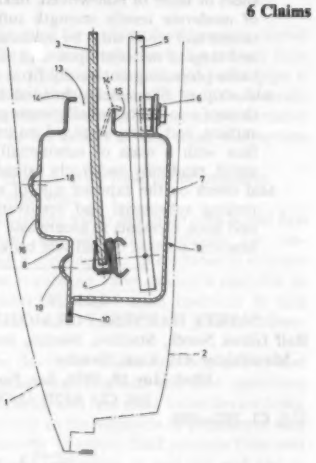
D. the radii of curvature of said wing portions of said air-deflecting surface are smaller at said base edge than said radius of curvature of said central portion and gradually increase until at said top edge the radii of curvature of said wing portions are merged into and become equal to the radius of curvature of said central portion.

4,056,280

DOOR FOR VEHICLES, IN PARTICULAR MOTOR VEHICLES

Andreas Bauer, Fallersleben, and Wolfgang Lange, Nordsteimke, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Mar. 31, 1975, Ser. No. 563,509
Claims priority, application Germany, Apr. 9, 1974, 2417192
Int. Cl.[2] B60J *5/04*
U.S. Cl. 296—146 **6 Claims**



1. A door for vehicles, particularly motor vehicles, having a shaft for a drop window located between an inner and an outer wall of the door, characterized in that at least the lower end of the shaft is surrounded by a hollow-section longitudinal supporting member located between the inner and outer walls of the door and having an opening in its upper region to permit entry of the window, the edges of the supporting member at the opening being formed as flange regions that overlap and interlock with each other so as to close the opening in the support member during a side impact on the outer wall of the door.

4,056,281

DISPOSABLE BACK SEAT HEADREST COVER

Leo A. Byrnes, Bloomfield Hills, Mich., assignor to Acme Mills Company, Detroit, Mich.

Filed Dec. 1, 1976, Ser. No. 746,530
Int. Cl.[2] A47C *7/62, 31/10*
U.S. Cl. 297—220 **6 Claims**

1. In a disposable back seat headrest cover for removable

attachment to and engagement with a strip of material having a plurality of male hook elements or barbs projecting outwardly from a base layer fixedly secured to and mounted upon the headrest portion of a seat back, the improvement comprising

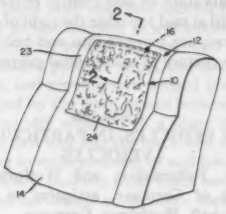
a substantially flat thin headrest cover sheet,

a substantially flat thin narrow strip of a non-woven olefin, fibrous, firm yet flexible, single layer of material, which is substantially impregnable and impervious to said hook elements, fixedly secured to said cover sheet along and adjacent one edge thereof,

said flat narrow strip of non-woven olefin material comprising a mass in a single layer of needled and garnetted polypropylene fibers, bonded together by the application of heat to one side of said mass to form a single sheet or layer of non-woven, flexible, felt-like material of moderate tensile strength sufficient to removably secure said cover sheet by moderate manual pressure to said strip of material upon said male hook elements or barbs projecting outwardly from said base layer,

said strip of fibers being bonded together on one side thereof into a substantially impregnable and impervious surface, and being arranged on its opposite facing surface with a mass of substantially disordered, disoriented, randomly and freely extending fibers,

said fibers on the exposed side of said cover sheet strip making substantial and removable engagement with said hook elements to secure said headrest cover to the headrest portion of said seat back.



4,056,282

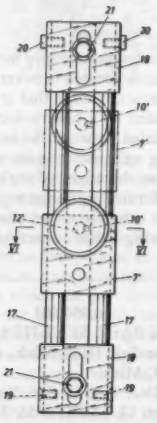
SAFETY HARNESS FOR MOTOR VEHICLES

Rolf Göran Nordh, Storfors, Sweden, assignor to Hakanssons Manufaktur AB, Amal, Sweden

Filed May 19, 1976, Ser. No. 687,880

Int. Cl.[2] A62B *35/00*

U.S. Cl. 297—389 **3 Claims**



1. An improved device in safety harnesses for motor vehicles, said device comprising a first fastening device for securement, of the harness at its lower end inwardly of a vehicle seat and a second fastening device for securement of the harness at the upper end outwardly of the vehicle seat, a slide provided on at least one of said fastening devices, said slide having one end of said harness attached thereto and arranged to be set in various positions of adjustment, the improvement comprising a guide member along which said slide is arranged to run, said guide including a pair of parallel rods, brackets affixed to both ends of the rod pair to retain same in fixed relative position, means on said brackets for attaching said guide to the desired vehicle portion, said slide comprising a body portion having parallel openings therein sized to slidably fit on the aforesaid parallel rods, said slide body having a bore made therein and provided with at least one locking means, said locking means moving freely in said bore in said slide body in a direction towards and away from one of the guide rods, the inner end of said locking means having a conical configuration, said slide body also provided with a clamp bolt formed with a conical portion and disposed in a position wherein it is at an angle to said bore containing said locking means, said clamp bolt arranged, upon its displacement in the axial direction, to urge its conical portion against the conical end of said locking element so as to press said locking means into abutment against one of the guide rods.

4,056,283

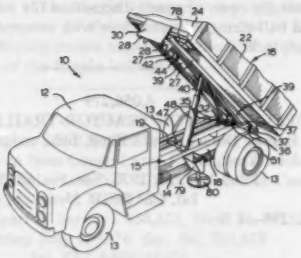
TRUCK CONSTRUCTION

Robert Marvin Pow, Woodstock, Canada, assignor to King Seagrave Limited, Woodstock, Canada

Filed Jan. 25, 1977, Ser. No. 762,258

Int. Cl.[2] B60P *1/04*

U.S. Cl. 298—17.6 **7 Claims**



1. In a load-carrying vehicle, a construction which comprises:

a load-supporting frame having a front and a rear,

a dumping box above the frame also having a front and a rear,

a fixed pivot at the rear of the frame, and first engagement means on the rear of the box for engaging the fixed pivot,

first locking means for selectively engaging or releasing said first engagement means with respect to the fixed pivot,

connecting link means having one end pivoted at said fixed pivot and the other end pivoted to the dumping box at an intermediate location therealong,

a displaceable pivot at the front of the frame, and second engagement means on the front of the box for engaging the displaceable pivot,

second locking means for selectively engaging or releasing said second engagement means with respect to the displaceable pivot,

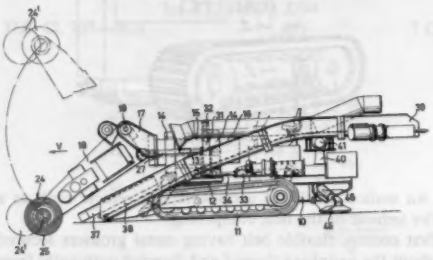
and a power means connected between a first location on the frame which lies between said pivots, and a second location on the box which lies between said first and second engagement means, the power means being capable of extending or contracting the distance between its connection locations.

4,056,284

MACHINES FOR USE IN MINING OR TUNNELLING WORK

Wilhelm Stoltefuss, Kamen; Herbert Haller, Gelsenkirchen-Buer, and Ottocar Hunscher, Altlunen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Aug. 4, 1975, Ser. No. 602,166
Claims priority, application Germany, Aug. 5, 1974, 2437683
Int. Cl.[2] E21C *25/08, 25/68*
U.S. Cl. 299—64 8 Claims



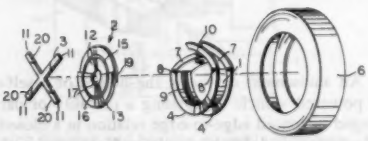
1. A machine for use in tunnelling or mining; said machine comprising a main chassis, an arm, support means for the arm, means connecting the arm to the support means for pivoting up and down in a generally vertical sense, rotary cutting means provided at a free end of the arm, the axis of rotation of the cutting means extending transversely of the arm and generally parallel to the axis of pivoting of the arm and means connecting the support means to the chassis for pivoting in a generally horizontal sense about a vertical axis; said support means being composed of a hollow body, bearing means mounting the hollow body on the connecting means for rendering the support means pivotable about an axis which extends parallel to the arm when horizontal and in the direction of advancement of the tunnelling or mining operation performed by the machine, a support member carrying the arm and extending within the hollow body and key means formed between the body and the support member for rendering the support member non-rotatable in relation to the hollow body while allowing displacement of the support member to extend and retract in relation to the hollow body whereby during operation the arm can be swung up and down and the support member displaced in relation to the hollow body to cause the rotary cutting means to move along a path which is approximately vertical.

4,056,285

COLLAPSIBLE TIRE WHEEL

Thomas Wright, 1783 A. Pacific St., Brooklyn, N.Y. 11213

Filed Mar. 11, 1977, Ser. No. 776,530
Int. Cl.[2] B60B *3/12, 25/02*
U.S. Cl. 301—8 3 Claims



1. A tire supporting rim comprising:

a. a wheel rim having a track on its internal surface and at least one pivotable section, said wheel rim adapted to fit within a tire when said pivotable section is fully extended, and

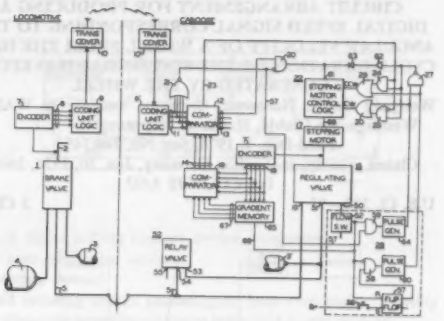
b. a sectioned disc formed from mutually slidable plates adapted to fit within said track to support said wheel rim when said sections are slidably extended, said plate sections including extensions of reentrant configuration to retain said sections together in slidable relationship.

4,056,286

REMOTE CONTROL BRAKE SYSTEM FOR A RAILWAY TRAIN

Richard O. Burkett, Apollo, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 8, 1976, Ser. No. 693,776
Int. Cl.[2] B60T *13/68*
U.S. Cl. 303—20 20 Claims



1. A remote control system for varying fluid pressure carried in a brake pipe extending continuously through a railway train having a locomotive at which one end of said brake pipe is terminated and a caboose at which the other end of said brake pipe is terminated to thereby obtain faster, more accurate synchronized control of the brakes of said train, said system comprising:

a. a main reservoir charged with fluid under pressure;

b. a first equalizing reservoir;

c. a first pressure regulating valve device to which said first equalizing reservoir and said main reservoir are connected, and having a cam member in response to rotation of which said first regulating valve device is operable to supply fluid pressure from said main reservoir to said equalizing reservoir and to release fluid pressure therefrom;

d. a first relay valve device to which said one end of said brake pipe, said main reservoir and said first equalizing reservoir are connected, said first relay valve device being operative responsively to the variation of pressure in said first equalizing reservoir to supply fluid pressure from said main reservoir to said brake pipe at said one end and to release fluid pressure therefrom;

e. first encoder means for providing a brake control signal according to the position in which said cam member of said first regulating valve device is rotated;

f. means for transmitting said brake control signal;

g. means for receiving said transmitted brake control signal at said caboose;

h. a second equalizing reservoir;

i. a second pressure regulating valve device to which said other end of said brake pipe and said second equalizing reservoir are connected and having a cam member in response to rotation of which said second regulating valve device is operable to supply fluid pressure from said other end of said brake pipe to said second equalizing reservoir and to release fluid pressure therefrom;

j. motor means for effecting rotation of said cam member of said second regulating valve device;

k. second encoder means for providing a feedback signal corresponding to the position in which said cam member of said second regulating valve device is rotated;

l. first comparator means for effecting operation of said motor means when a difference exists between said brake control signal and said feedback signal; and

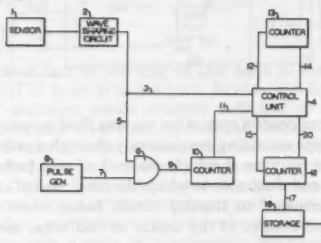
m. a second relay valve device to which said other end of said brake pipe and said second equalizing reservoir are connected, said second relay valve device being operative responsive to variation of pressure in said second equalizing reservoir to effect release of fluid pressure from said other end of said brake pipe accordingly.

4,056,287

CIRCUIT ARRANGEMENT FOR PRODUCING A DIGITAL SPEED SIGNAL CORRESPONDING TO THE ANGULAR VELOCITY OF A WHEEL FROM THE HALF CYCLE DURATION OF THE SINUSOIDAL WAVEFORM GENERATED BY THE WHEEL

Wolfgang Gudat, Hannover, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany

Filed Dec. 9, 1976, Ser. No. 748,745
Claims priority, application Germany, Jan. 20, 1976, 2601800
Int. Cl.² B60T *8/02*
U.S. Cl. 303—91 **5 Claims**



1. A circuit for providing a digital wheel speed signal comprising:

a. wheel sensor means for generating a sinusoidal waveform having a frequency directly proportional to the angular velocity of a vehicle wheel;

b. a gating circuit connected with said wheel sensor means so as to be enabled during a first half cycle duration of said sinusoidal waveform;

c. first pulse generator means for emitting pulses at a constant frequency;

d. a first multi-stage digital counter to which said impulses are connected via said gating circuit only so long as said gating circuit is enabled, said first counter providing an output signal that varies inversely with the angular wheel velocity; and

e. control means for modifying the output signal of said first counter so as to vary in direct proportion to the angular wheel velocity comprising:

i. a second multi-stage digital counter;

ii. first means for supplying impulses to said second counter at a frequency that changes exponentially;

iii. a third multi-stage digital counter;

iv. second means for supplying impulses to said third counter at a frequency that changes exponentially;

v. comparator means for activating said second means only when the output signals of said first and second counters are equal; and

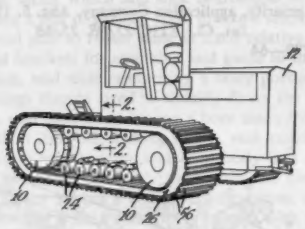
vi. means for recognizing the final stage of said second counter to deactivate said second means, whereby the output of said third counter corresponds to the difference between the final stage output of said second counter and the output of said first counter following expiration of said first half cycle duration of said sinusoidal waveform.

4,056,288

ENDLESS TRACK FOR CRAWLER VEHICLES

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 1, 1976, Ser. No. 662,200
Int. Cl.² B62D *55/24*
U.S. Cl. 305—34 **9 Claims**



1. An endless track for a track laying vehicle such as a crawler vehicle or the like, comprising:

a first endless, flexible belt having metal grousers secured about the periphery thereof and directed outwardly from the exterior surface thereof;

an endless, flexible, collapsible carcass including a fluid receiving chamber having an exterior surface removably secured to the interior surface of said first endless belt; and

a second endless, flexible belt having an exterior surface removably secured to the interior surface of said carcass and a plurality of sprocket engaging lugs directed inwardly from the interior surface thereof;

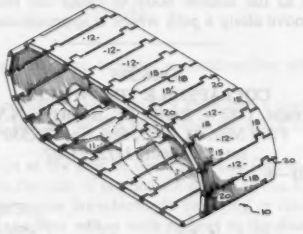
said belts and said carcass being constructed and arranged to permit disassembly when said carcass is collapsed and to preclude disassembly when installed on a crawler vehicle or the like and when said carcass is filled with fluid.

4,056,289

OCCUPANT PROPELLED TREAD VEHICLE

George E. Gilliland, 6001 Topke, Albuquerque, N. Mex. 87101

Filed Oct. 14, 1975, Ser. No. 622,040
Int. Cl.² B62D *55/22*
U.S. Cl. 305—47 **16 Claims**



1. An amusement device in the nature of a self-complete, user powered vehicle comprising a plurality of parallel slats arranged in spaced edge-to-edge relation in a closed flat loop configuration, said slats having inner faces forming the internal surface of said loop and outer faces forming the outer surface of said loop, and hinge means provided between facing edges of said slats for permitting relative pivotal movement of adjacent slats inwardly with respect to said loop but preventing substantial relative pivotal movement of said slats in a reverse direction outwardly of said loop beyond a position in which said slats are in substantial coplanar orientation, said slats being of sufficient number and size to form a loop of adequate size to permit a user to assume a position of use fully within the con-

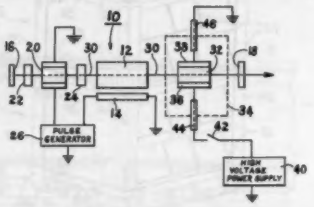
fines of said internal surface of said loop or to be supported on the upper external surface of said loop.

4,056,290

METHOD OF CHANGING THE FREQUENCY OF A LASER BEAM

Lloyd C. Bobb, Willow Grove, and Kimball Kramer, Philadelphia, both of Pa., assignors to The Government of the United States as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1976, Ser. No. 667,911
Int. Cl.[2] H02M 5/04
U.S. Cl. 307—88.3 **7 Claims**



1. In a laser system of the type wherein an active laser element is energized to produce a laser beam of substantially one frequency, ω_1, the improvement in the method of changing the frequency of said laser beam by a frequency ω_2, comprising

disposing a crystal of a single crystal structure, having paraelectric and ferroelectric states above and below a Curie point, respectively, in the path of said laser beam,

maintaining said crystal in its paraelectric state at substantially constant temperature just above its Curie point, when the laser beam emerging from said crystal is to remain substantially unchanged in frequency, and

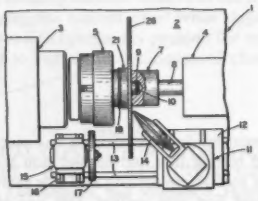
applying a voltage of sufficient value across said crystal to drive it into its ferroelectric state and generate radiations of frequency ω_2, when the laser beam emerging from said crystal is to have frequencies of $\omega_1 \pm \omega_2$.

4,056,291

CLUTCH HOUSING AND BEARING ASSEMBLY AND METHOD OF MAKING THE SAME

Derald H. Kraft, Canton, and Richard C. St. John, North Canton, both of Ohio, assignors to Aspro, Inc., Canton, Ohio

Division of Ser. No. 601,346, Aug. 4, 1975. This application Oct. 26, 1976, Ser. No. 735,509
Int. Cl.[2] F16C 33/08
U.S. Cl. 308—189 R **7 Claims**



1. A clutch housing and bearing assembly including;

a. a cup-shaped bearing housing having a circumferential flange with an inturned web wall at one flange end and an annular retaining shoulder at the other flange end;

b. bearing means telescopically mounted within the circumferential flange and clamped axially between the web wall and retaining shoulder;

c. a larger cup-shaped clutch housing having an annular cup wall extending in a radial direction with respect to the bearing housing and terminating in an annular flange; said annular flange extending axially from the clutch housing cup wall in a direction opposite to the bearing housing; and

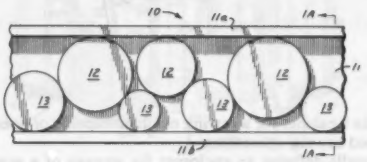
d. the clutch housing cup wall being integrally connected with the bearing housing at the retaining shoulder.

4,056,292

LINEAR ROLLING CONTACT DEVICES

Earl W. Traut, 8040 Palm Lake Drive, Orlando, Fla. 32811

Filed Aug. 2, 1976, Ser. No. 710,797
Int. Cl.[2] F16C 23/08
U.S. Cl. 308—206 **12 Claims**



1. A linear rolling contact device comprising:

at least one linear surface,

rotating means,

said rotating means including at least two major rotating elements in rolling contact with said linear surface,

retaining means,

said retaining means being in rolling contact with said rotating elements and acting to prevent same from moving away from each other,

separating means,

said separating means including at least one roller,

said separating means being in rolling contact with said rotating elements and acting to prevent same from moving towards each other,

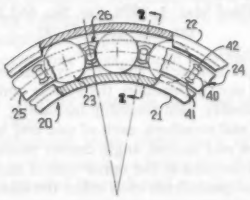
said retaining means and said separating means not being fastened to said linear surface.

4,056,293

SEGMENTED RETAINERS

John Hillman Lobeck, and Raymond Harold Lindgren, both of South Bend, Ind., assignors to The Torrington Company, Torrington, Conn.

Filed Apr. 20, 1976, Ser. No. 678,675
Int. Cl.[2] F16C 33/46
U.S. Cl. 308—217 **20 Claims**



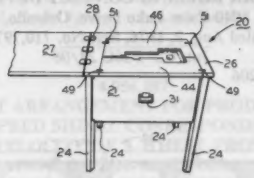
1. A segmented retainer for a roller bearing, said retainer comprising a pair of end rings, a plurality of separator bars extending between said end rings, and means securing said bars to said end rings, each bar having at opposite sides thereof a set of inner and outer bearing surfaces for engagement by rollers, bearing surfaces of each set being spaced from each other to define a lubricant pocket therebetween, and each of said bearing surfaces being convex for cooperation with an associated roller for assuring a supply of lubricant between the roller and said surfaces.

4,056,294

OPEN ARM SEWING MACHINE CABINET

Walter A. Godlewski, Maywood; Bernard S. Roser, Arlington Heights, and John B. Lyons, Chicago, all of Ill., assignors to Montgomery Ward & Co., Incorporated, Chicago, Ill.

Filed Sept. 22, 1976, Ser. No. 725,401
Int. Cl.[2] D05B 75/00; A47B 57/20
U.S. Cl. 312—30 8 Claims



1. In a cabinet for a sewing machine capable of open arm or flat bed sewing operations:

a. walls defining an enclosure for storage of a sewing machine;

b. first and second pairs of panels wholly pivotal within opposed walls of said enclosure and movable to positions selectively to provide work surfaces for open arm and flat bed sewing;

c. said first pair of panels supporting said machine for both flat bed and open arm sewing;

d. said second pair of panels overlying said first pair of panels and being movable into position over said first pair of panels into planar relationship to define a work surface for flat bed sewing;

e. one of said first pair of panels having said machine secured thereto and being hinged to the walls of said enclosure internally thereof for storage of said machine beneath the plane of said second pair of panels;

f. the second of said first pair of panels being hinged to walls of said enclosure in opposed relationship to said one panel of said first pair, and being swingable out of position by movement of the said one of said first pair of panels to the working position of said machine for both open arm and flat bed sewing;

g. meas biasing the said second of said first pair of panels to a position to support said machine after reverse swinging movement of the said one of said first panels.

4,056,295

MULTIPLE CONTAINER AND RACK SYSTEM

Benjamin A. Downing, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 1, 1976, Ser. No. 662,798
Int. Cl.[2] A47B 87/00
U.S. Cl. 312—107 8 Claims

1. A multiple container and rack system for use both as a transport and storage medium, the system comprising:

a frame assembly, said assembly including

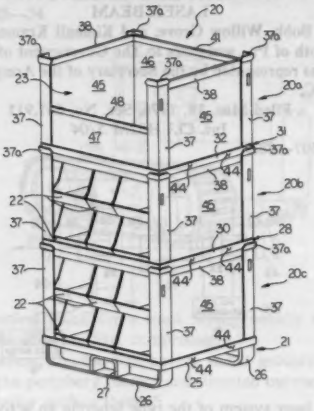
a pair of end members, each of said end members including first and second angle corner posts, a rail member fixedly secured at the upper end of each post to maintain said posts from each other the distance of said rail member, and

at least one side member, said side member including first and second angle leg members and a rail member fixedly secured to the upper end of said leg members;

means for detachably securing each of said side member angle legs nestably within a respective receiving angle corner post;

base means includes a flange member for receiving said frame assembly therein and thereby defining a modular unit for receipt of articles to be carried thereby;

receiving means on each corner post to permit nestably receipt of one additional modular unit in a stacking manner; restraining means includes at least one inwardly projecting element at each of said flange member upward portions wherein said projecting elements engage the lower angle member of said end member thereby preventing relative vertical displacement thereof; and



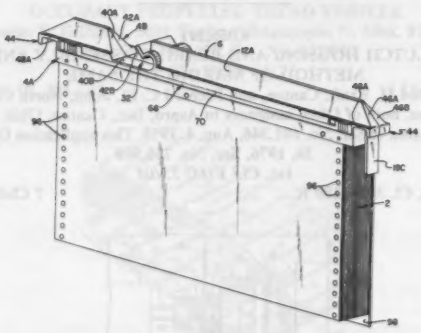
said restraining means cooperating between said base means and said frame assembly to prevent vertical displacement of said frame assembly from said base means.

4,056,296

DOCUMENT HOLDER

Norman A. Hedstrom, Worcester; David M. Wright, and Jerome O'Toole, both of Shrewsbury, all of Mass., assignors to Wright Line Inc., Worcester, Mass.

Filed Mar. 17, 1976, Ser. No. 667,613
Int. Cl.[2] A47B 63/00; B42F 15/00
U.S. Cl. 312—184 32 Claims



1. A document holder comprising a one-piece body molded of plastic and having first and second side sections, a single integral hinge section connecting said side sections, and a pair of holes in said first side section, said one-piece unit being molded with said hinge section unfolded and said side sections being separated from one another and said hinge section being foldable so as to bring said side sections into confronting relation with one another, a pair of document mounting posts attached to the second side section, said posts being located so that the free end of each is received by one of said holes when said side sections are in confronting relation with one another, said side sections being formed so that when they confront one another they form a channel for receiving margin portions of documents to be mounted on said posts, and lock means separate from said posts for locking said side sections together in

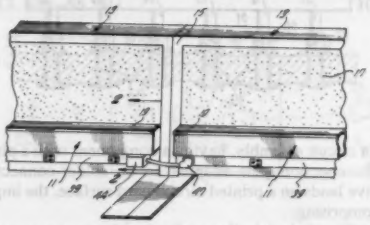
mutually confronting relation, said lock means comprising at least one movable latch attached to one of said side sections and a catch disposed on the other of said side sections in position to engage and positively hold said at least one latch when said side sections are removed into said mutually confronting relation.

4,056,297

REMOVABLE ELECTRICAL FIXTURES FOR MODULAR WALL PANELS

Clifford W. Gartung, Santa Ana, Calif.

Filed Nov. 15, 1976, Ser. No. 741,797
Int. Cl.[2] H02G *3/26*
U.S. Cl. 339—23 **8 Claims**



4. In a reconfigurable modular sound absorbing office screen system having a plurality of hollow rigid square frame members with vertical side support members and interconnecting horizontal support members and a central sound absorbing panel of resilient fiberglass material mounted in and supported on all four peripheral sides of the rigid frame member, the frame member capable of being interconnected to other frame members to form a predetermined wall partition configuration independent of the structural support walls of an office building, the improvement consisting of;

a hollow molding member;

mounting means on the hollow molding member for insertion between the elongated channel housing member and the resilient sound absorbing panel, and

mounting tab means attached to the respective ends of the molding member, the combined length of the mounting tab means and the molding member being greater than the horizontal interior distance between the side support members but less than the diagonal distance across the sound absorbing panel, the mounting tab means being removably inserted between the sound absorbing panel and the frame side support members by diagonally positioning the molding member relative to the frame member and depressing the resilent panel while sliding the upper end downward to operatively position the molding member parallel to and above the elongated channel housing member.

4,056,298

ELECTRICAL CONNECTOR WITH COUPLING ASSEMBLY BREECH RETAINING MEANS

Earl A. Cooper, Los Angeles, and Michael J. Howett, Fountain Valley, both of Calif., assignors to Automation Industries, Inc., Los Angeles, Calif.

Filed Oct. 7, 1976, Ser. No. 730,449
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—90 R **7 Claims**

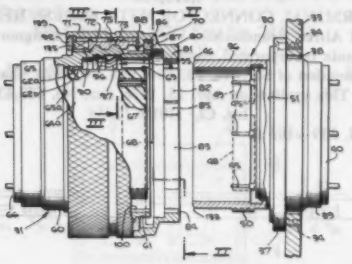
1. A retaining means for use on an electrical connector having inner and outer coaxial cylindrical members, one of said members being rotatable to transmit forces to the other member to cause relative axial movement of said members, comprising in combination:

one of said members having an end portion provided with angularly spaced internal axially extending grooves on the internal surface thereof;

recess means in said internal surface on said end portion between said grooves and in communication therewith;

an annular retainer member having a circumference provided with angularly spaced locking lugs corresponding to said grooves and receivable within said end portion;

said recess means being provided with end walls;



said annular retainer member being axially movable relative to said one member to pass said locking lugs through said grooves, and said retainer member being rotatable to align said locking lugs with said recesses,

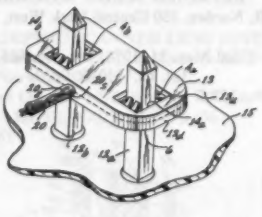
and spring means for biasing said retainer member in a direction to cause said locking lugs to be positioned in said recesses.

4,056,299

ELECTRICAL CONNECTOR

Walter Griffin Paige, Pasadena, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 3, 1976, Ser. No. 682,770
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—95 D **2 Claims**



1. An electrical connector for connecting a pair of wires, each wire carrying a different voltage level, to adjacent terminal pins on a backplane, comprising:

a. a pair of conductive flags, spaced a predetermined distance apart;

b. an opening centrally located in each flag of said pair of conductive flags;

c. a pair of bifurcated strips within each of said central openings to provide teeth for biting into the surface of a terminal pin inserted through said opening;

d. an insulating cover which integrally provides a hermetic seal to said pair of conductive flags and said pair of wires while rigidly maintaining said flags a predetermined distance apart, said insulating cover having openings oriented to expose the central opening of each flag and the ends of the teeth within the opening of each of said flags;

e. said insulating cover having one end provided with a shape distinguished from the shape of the other end to readily identify one wire of the twisted pair from the other wire in order to distinguish the level of each wire in the pair of wires, thus to reliably insure the proper voltage

orientation and proper connection of the wires when connected on the terminal pins of said backplane;

f. each of said openings in said hermetically insulating cover providing sufficient exposed area about the central openings of the flag and about the teeth therein to permit bending of said teeth into contact against said backplane pins.

4,056,300

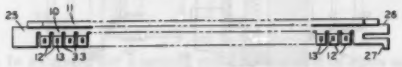
TERMINAL CONNECTOR WITH STRESS RELIEF

Donald Alfred Schumacher, Lockport, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 333,886, Feb. 20, 1973, abandoned. This application Apr. 15, 1976, Ser. No. 677,431

Int. Cl.[2] H01R *13/58*

U.S. Cl. 339—103 R **4 Claims**



1. A connector for pluggable engagement between terminals carried by said connector and terminals carried by a panel comprising:

a strip member of elastic insulating material having a plurality of lands arrayed longitudinally on one edge on said member, said lands formed by a plurality of slots extending through said strip member transversely to the longitudinal dimension thereof, each of said lands having a single opening located substantially within said lands and extending through said lands, terminals pressure fitted through more than one of said openings with sufficient force to cause said elastic insulating material to be displaced, said terminals extending on both sides of said strip member for mating electrical connections thereto.

4,056,301

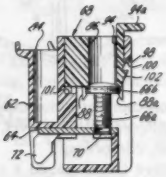
RETAINED SCREW ASSEMBLY

Alexander R. Norden, 350 Central Park West, New York, N.Y. 10025

Filed Mar. 11, 1976, Ser. No. 665,925

Int. Cl.[2] H01R *9/10*

U.S. Cl. 339—263 R **18 Claims**



1. An electrical connector including a stationary unit having a body of electrical insulation and a metal member assembled to said body and having a threaded hole therein, a screw for securing a retained wiring element to said metal member, said screw having a head and a threaded body extending from the underside of the head for driving entry into the threaded hole, and a screw retainer movably connected to said stationary unit and having resilient nest means for releasably retaining said screw head, said stationary unit and said screw retainer having cooperating portions for locating the screw, when the head thereof is in said nest means, in a position ready for insertion into the threaded hole with said threaded body aligned with the threaded hole, said screw retainer being movable relative to said stationary unit for carrying the screw when in the nest means away from said ready-for-insertion position to a removed position with the free end of the screw displaced from the metal member to free the space adjacent the threaded hole for admission and removal of a wiring element.

4,056,302

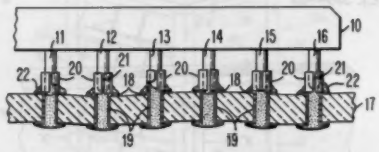
ELECTRICAL CONNECTION STRUCTURE AND METHOD

Roland Joseph Braun, Vestal, and William Ditlef von Voss, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 4, 1976, Ser. No. 693,051

Int. Cl.[2] H01R *5/04*

U.S. Cl. 339—275 B **8 Claims**



1. In a circuit assembly, having a component with a plurality of interconnection pins adapted to be solder-connected to respective lands on a printed circuit card surface, the improvement comprising:

a plurality of electrically conductive sleeve connectors, one for each pin of said component and adapted to be variably slideably mounted thereon according to the distance between said pin and said respective land with at least one of said pins being in direct contact with its said land, to thereby assure electrical contact between each of said pins and the respective land on the surface of said printed circuit card to which the pin is to be connected, said connectors being exclusively on the surface of said card.

4,056,303

OPTICAL INSTRUMENT IN WHICH EYEPIECE TUBE AND OBJECTIVE TUBE ARE SURROUNDED IN CAST RESIN TO MAKE A RIGID CORE ENCLOSED IN FOAMED SYNTHETIC RESIN

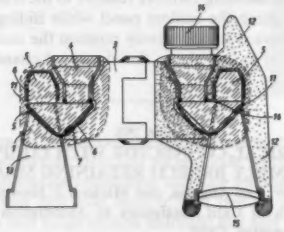
David Swarovski, Wattens, and Kurt Schwab, Innsbruck, both of Austria, assignors to D. Swarovski & Co., Glasschleiferei, Wattens, Austria

Filed May 18, 1976, Ser. No. 687,457

Claims priority, application Germany, May 22, 1975, 2522738; Apr. 27, 1976, 2618497

Int. Cl.[2] G02B *23/18*

U.S. Cl. 350—36 **13 Claims**



1. An optical instrument comprising:

an image-erecting system;

an eyepiece tube;

an objective tube;

said image-erecting system, said eyepiece tube and said objective tube being at least partially enclosed in cast resin and thereby positioned and forming a rigid core; and

a foamed synthetic resin covering extending around the

periphery of said rigid core and fixedly secured thereto to form the housing of the instrument.

4,056,304

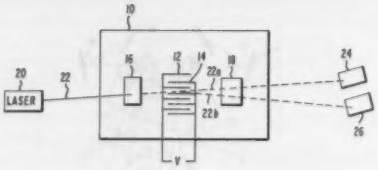
LIGHT MODULATION EMPLOYING SINGLE CRYSTAL OPTICAL WAVEGUIDES OF NIOBIUM-DOPED LITHIUM TANTALATE

William Phillips, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 555,725, March 6, 1975, which is a continuation-in-part of Ser. No. 442,844, Feb. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 434,408, Jan. 18, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 744,126

Int. Cl.² G02B 5/23; B05D 5/06

U.S. Cl. 350—96 WG 10 Claims



1. In a light modulator comprising a source of coherent light, an optical waveguide, a plurality of electrodes disposed in said waveguide, optical input means disposed on one side of said electrodes and optical output means disposed on the other side of said electrodes, the improvement which comprises employing as said optical waveguide a crystal prepared by depositing a film of niobium oxide on one surface of a polished single crystal of lithium tantalate, annealing the single cyrstal of lithium tantalate so as to allow the niobium to diffuse into the crystal and cooling the crystal.

4,056,305

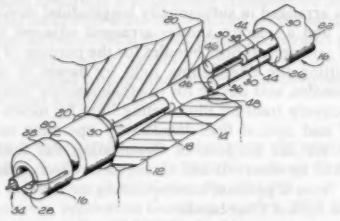
SINGLE OPTICAL FIBER CONNECTOR UTILIZING ELASTOMERIC ALIGNMENT DEVICE

Ronald L. McCartney, Orange; Bruce K. Arnold, El Toro, and Vaughn C. Hogan, Sun Valley, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,170

Int. Cl.² G02B 5/16

U.S. Cl. 350—96 C 20 Claims



1. A fiber optic connector comprising:

a deformable elastomeric alignment element having a bore therethrough;

a pair of fiber optic contacts mounted in opposite ends of said bore, each said contact comprising three equal diameter, generally parallel, flexible cylindrical rods having an optical fiber positioned therebetween, the rods and fiber of each said contact terminating in a common planar mating end face; and

said rods of each contact having an interference fit in said bore causing said rods to be resiliently compressed inwardly to engage each other and said fiber therebetween, whereby said fibers will become precisely laterally aligned.

4,056,306

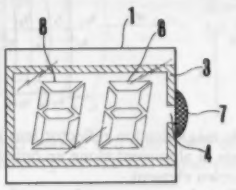
LIQUID CRYSTAL DISPLAY DEVICE AND METHOD OF MANUFACTURING THE SAME

Masayoshi Misono, Chosei; Masaharu Koayama, and Tutomu Asida, both of Mobara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 13, 1976, Ser. No. 722,437

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC 5 Claims



1. A liquid crystal display device comprising a pair of parallel insulating substrates spaced a predetermined spacing, at least one of the substrates being transparent, opposed electrodes formed on the opposing surfaces of said substrates, a peripheral sealing member for sealing the peripheries of said substrates for defining a space for accommodating a liquid crystal, means for defining a filling port at a portion of said sealing member for filling the liquid crystal into said space, a metal layer formed across the full width of the side surfaces of said substrates sandwiching said peripheral sealing member surrounding said filling port, and a solder layer applied onto said metal layer for sealing said filling port, said solder layer having an amount of 0.1 to 1.2mg/mm².

4,056,307

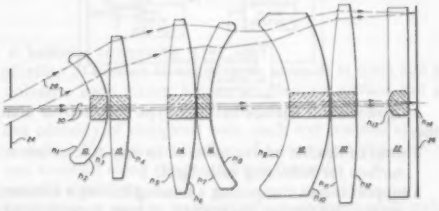
ANAMORPHIC SCANNER LENS SYSTEM

Juan L. Rayces, Santa Ana, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Oct. 29, 1976, Ser. No. 737,140

Int. Cl.² G02B 13/08, 3/06

U.S. Cl. 350—181 8 Claims



1. An anamorphic scanner lens system comprising in axial alignment:

a plurality of pairs of cylindrical lens elements, the cylinder axes of the surfaces thereof being at right angles to the direction of the scan line, each pair consisting of a biconvex positive lens and a negative meniscus lens, the concave side of the menisci alternate pointing toward the direction of the light and in the direction of the light;

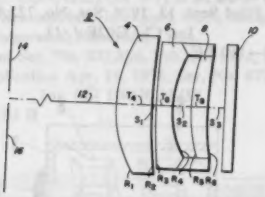
aperture stop means disposed in front of said plurality of pairs of lens elements; and

a cylindrical lens element disposed behind said plurality of pairs of lens elements having a front surface having an axis parallel to the scan line and having a substantially flat rear surface.

4,056,308
VARIABLE FOCAL LENGTH REFLECTOR LENS SYSTEM

George Louis McCrobie, Upland, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1976, Ser. No. 663,394
Int. Cl.[2] G02B 15/14, 17/00
U.S. Cl. 350—184 3 Claims

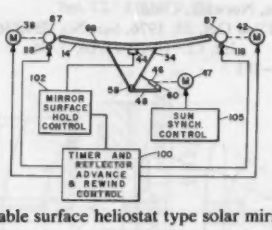


1. A variable magnification reflector lens including the following elements in alignment along an optical axis:
a positive crown element,
a negative flint element spaced from said crown element,
a meniscus element spaced from said flint element,
a reflector spaced from said meniscus element,
said corwn element and said reflector being fixed relative to each other,
said flint and meniscus elements being movable in the same direction along said optical axis relative to said crown element and said reflector to vary the focal length of said lens.

4,056,309
RENEWABLE SURFACE HELIOSTAT TYPE SOLAR MIRROR

Robert Campbell Harbison; Gerald Arthur Bradley, and Paul Arthur Lux, all of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed May 4, 1976, Ser. No. 682,911
Int. Cl.[2] G02B 5/10
U.S. Cl. 350—310 22 Claims

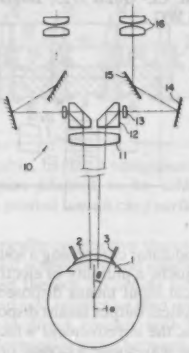


1. A renewable surface heliostat type solar mirror comprising:
a sheet of flexible mirror material having at least one mirror surface for reflecting solar light,
a support means comprising a housing having a substantially planar surface for supporting at least a portion of said sheet material with said mirror surface on the outside,
sheet holding means for selectively adhering said sheet material against the surface of said support means,
said support means having a surface shape and curvature whereby said mirror surface directs solar light toward a receiver,
sheet moving means positioned in said housing for selectively moving and changing the flexible mirror material on said support member, whereby new mirror material selectively replaces used mirror material,
control means for de-energizing said sheet holding means and energizing said sheet moving means for changing the flexible mirror material and then re-energizing said sheet holding means,
and said housing having surface edges with a lip extension enclosing the ends and sides of said sheet mirror material for reducing wind lifting of the sheet material from the support surface.

4,056,310
METHOD AND DEVICE FOR OPHTHALMOSCOPY

Hiroyuki Shimizu, Utsunomiya; Kouji Inaba, Tokyo, and Ken-Ichi Nakahashi, Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1976, Ser. No. 658,053
Claims priority, application Japan, Feb. 14, 1975, 50-19729[U]; June 20, 1975, 50-83571[U]; June 20, 1975, 50-74358; Sept. 12, 1975, 50-110603; Sept. 12, 1975, 50-110604
Int. Cl.[2] A61B 3/10; G02B 5/16
U.S. Cl. 351—6 8 Claims



1. A method for ophthalmoscopy comprising the steps of arranging a contact lens in contact with an eyeball to be observed in order to observe the eyeball by eliminating refraction of light by the surface of the cornea of the eyeball, illuminating the fundus of the eyeball by transmitting illuminating light through a plurality of optical fiber bundles having exit ends arranged along the circumference of the contact lens and entrance ends arranged opposite to a light source, and observing a magnified erect image by means of a head-band scope comprising a binocular telescopic optical system arranged opposite to and distant from the contact lens.

4. (amended) A device for ophthalmoscopy comprising a contact lens, a plurality of optical fiber bundles having exit ends fixed along the circumference of said contact lens by inclining said exit end by 10° through 20° with respect to the optical axis of the contact lens, a tubular holder carrying said contact lens at one end thereof and carrying said optical fiber bundles arranged in substantially longitudinal direction of the holder, and a selector shutter arranged adjacent to entrance ends of said optical fiber bundles for the purpose of selectively transmitting the illuminating light by means of said optical fiber bundles, said device for ophthalmoscopy being arranged to selectively transmit illuminating light by means of at least one of said optical fiber bundles by operating said selector shutter for the purpose of illuminating the fundus of the eyeball to be observed and arranged to observe through said holder from a position corresponding to the exit end of the selected optical fiber bundle.

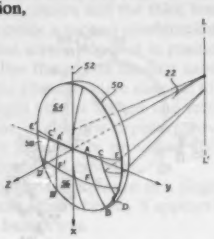
4,056,311
PROGRESSIVE POWER OPHTHALMIC LENS HAVING A PLURALITY OF VIEWING ZONES WITH NON-DISCONTINUOUS VARIATIONS THEREBETWEEN

John Talley Winthrop, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 389,042, Aug. 16, 1973, abandoned. This application Oct. 1, 1975, Ser. No. 619,143
Int. Cl.[2] G02C 7/06
U.S. Cl. 351—169 19 Claims

1. An ophthalmic lens comprising a lens body having a first refractive surface viewing zone thereon characterized by

a smooth, unbroken principal meridional curve having continuously varying slope lying along the refractive surface viewing zone in a generally vertical direction and dividing the refractive surface viewing zone into two similar lateral portions, the curvature of the principal meridional curve varying progressively from point to point therealong to provide a predetermined dioptric focal power at each such point according to a predetermined law, the dioptric focal power increasing generally from top to bottom of the viewing zone along the principal meridional curve, and being characterized further by having cross curves defined on the refractive surface viewing zone by planes perpendicular to the principal meridional curve, the curvatures of the cross curves at their points of intersection with the principal meridional curve being respectively equal to the curvature of the meridional curve at the point of intersection,



the first refractive surface viewing zone defined by a power range varying from a first dioptric focal power at the top of the viewing zone to a second, higher dioptric focal power at the bottom of the viewing zone, the viewing zone being divided into at least three laterally disposed areas,

a first one of the three areas being centrally disposed in the viewing zone, extending vertically therethrough, and having the principal meridional curve passing through the center thereof, and

the two outermost of the three areas being disposed at the lateral peripheries of the viewing zone and each having a surface so curved that the condition

$$\frac{\partial^2 f}{\partial x \partial y} = 0$$

is fulfilled when y and x are the coordinates in the horizontal and vertical directions respectively of said outermost areas and f is the distance of the refractive surfaces from the x–y plane whereby skew distortion is so optically compensated that at all points on said outermost areas the principal axes of astigmatism lie in vertical and horizontal planes which are parallel to the x and y axes respectively to permit a wearer of the lens to perceive horizontal and vertical lines in the visual environment as being horizontal and vertical.

4,056,312

FILM TITLE MACHINE FOR AMATEUR FILMMAKERS

Werner Uhlig, Junkeracker 31, D-7540 Neuenburg, Germany

Filed Apr. 7, 1976, Ser. No. 674,396
Claims priority, application Germany, Apr. 12, 1975, 2516080
Int. Cl.² G03B *21/32*
U.S. Cl. 352—90 **8 Claims**

1. A film titling machine, for use by amateur film makers, which comprises:

a pair of parallel shaft rollers;

a continuous belt driven and supported by said shaft rollers;

two pairs of support legs for supporting said shaft rollers;

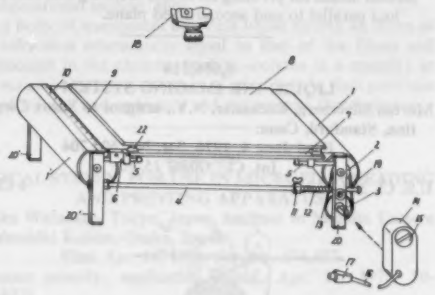
longitudinally adjustable rods for holding apart said support legs;

support pads attached to said support legs, parallel to said rods;

a motive plate resting on said support pads, said motive plate protruding beyond the sides of said continuous belt;

distance pieces attached to the sides of said motive plate; and

an object plate, which is transparent and reflection free, resting on said distance pieces parallel to said motive



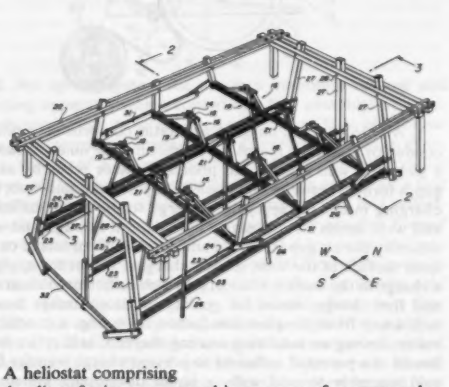
plate, the upper part of said continuous belt moving between said motive plate and said object plate.

4,056,313

MULTIPLE MIRRORED APPARATUS UTILIZING SOLAR ENERGY

Porter R. Arbogast, 281 W. Langhorne Ave., Bethlehem, Pa. 18017

Filed June 15, 1976, Ser. No. 696,176
Int. Cl.² G03B *21/00*; F24J *3/02*; G02B *5/08*
U.S. Cl. 353—3 **2 Claims**



1. A heliostat comprising

a plurality of mirrors arranged in an array of m rows and n columns, each mirror having a reflective surface and a rear surface and a central axis through each surface;

a like plurality of elongated rods, each rod coupled at one end thereof to the rear surface of a corresponding mirror and oriented along the central axis thereof;

n support structures;

pivotal support means for pivotably supporting each rod, near said one end, with respect to said support structures;

n pairs of first guide rails coupled to said support structures, each pair being spaced apart to form a track therebetween for receiving depending portions of said rod to enable said rods to traverse pivotable paths within said tracks within planes each perpendicular to first common fixed plane;

a frame for supporting said support structures;

m pairs of second guide rails, each pair being spaced apart to form a track therebetween for receiving depending portions of said rods near their opposite ends to enable said rods to traverse pivotal paths within said tracks within planes each perpendicular to a second common fixed plane, said second common fixed plane being perpendicular to said first fixed plane;

a plurality of arms coupling said second guide rails to said

frame so that said arms are pivotable with respect to said frame;

first means for pivoting all of said first guide rails along loci parallel to said first fixed plane; and

second means for pivoting all of said second guide rails along loci parallel to said second fixed plane.

4,056,314

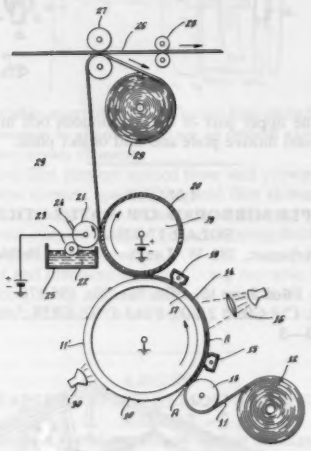
LIQUID INK IMAGING SYSTEM

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 4, 1976, Ser. No. 692,704

Int. Cl.[2] G03G *15/10*

U.S. Cl. 355—10 **4 Claims**



1. An electrostatic imaging apparatus comprising: a photoconductor assembly; means for positioning the inner surface of a dielectric web against said photoconductor whereby an air gap is formed between said photoconductor and said web; first charging means for applying a charge to the outer surface of said web; means for exposing a light pattern through said web, whereby the air gap is ionized and forms a latent image on the inner surface of the web; second charging means for applying a charge to the outer surface of said web sufficient to neutralize said first charge; means for guiding the latent image bearing web away from the photoconductor, including, a conductive roller, having an insulating coating thereon, said roller being biased at a potential sufficient to prevent charge transfer from said assembly to said web; a liquid developing system for developing the latent image on said web; and means for transferring said developed image from said web to an image copy member.

4,056,315

SQUEEZE ROLLER RETRACTION ASSEMBLY

Kenzo Ariyama; Sakae Ota, both of Tokyo; Sunao Ikeda, and Toyoo Okamoto, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jan. 9, 1976, Ser. No. 647,816

Claims priority, application Japan, Jan. 14, 1975, 50-6714

Int. Cl.[2] G03G *15/10, 21/00*

U.S. Cl. 355—10 **8 Claims**

1. An electrophotographic copying machine comprising, in combination, a phtosensitive drum; a pair of sidewalls for rotatably mounting said drum therebetween; one of said sidewalls having an opening to permit a passage of said drum therethrough; a cover plate detachably mounted on said one sidewall to cover the opening and rotatably mounting a corresponding end of said drum; a squeeze member, normally maintained close to the peripheral surface of said drum, mounted on said sidewalls, for removing an excess amount of a developing solution from the drum surface; and a squeeze member retraction assembly comprising:

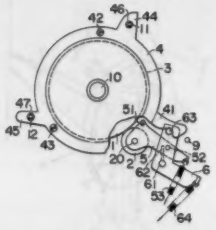
a. first lever means swingable about a stationary axis parrallel to the axis of said drum and supporting said squeeze member,

b. first spring means connected to said first lever means for urging the squeeze member to be maintained close to said drum surface,

c. second lever means having a detent member attached thereto and mounted for movement of said detent member in a plane perpendicular to the drum axis along a predetermined path,

d. second spring means connected to said second lever means,

e. detent plate means, including a detent portion releasably



engageable with said detent member against the bias of said second spring means, mounted on said cover plate and extending over and in the detent member path when the cover plate is mounted on said one side wall, and said detent portion releasing said detent member in response to dismounting of said cover plate from said one side wall, and

f. means operable to interconnect said first and second lever means when said detent member is released from said detent portion, whereupon said second spring means overcomes the bias of said first spring means to move said squeeze member away from the drum surface, said detent portion reengaging said detent member in response to remounting of said cover plate on said one sidewall to disconnect said second lever means from said first lever means for movement of said squeeze member close to the drum surface by the bias of said first spring means.

4,056,316

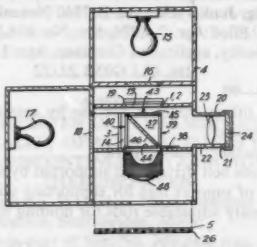
METHOD AND APPARATUS FOR MAKING A PRINT OF AN OBJECT

Howard C. Zutrauen, 119-05 103rd Ave., Richmond Hill, N.Y. 11419

Filed Apr. 9, 1976, Ser. No. 675,306

Int. Cl.[2] G03B *27/32, 35/14*

U.S. Cl. 355—22 **9 Claims**



1. A method of making a print of an object, photographed by

a stereo camera to provide first and second stereo transparencies thereof, which print appears to the human eye to be three-dimensional, said method comprising the steps of

copying one of the first and second transparencies to prepare a third transparency;

optically superimposing the first transparency provided by the stereo camera and the third transparency on each other to provide a first combination of light;

preparing a line screen negative having a plurality of black lines of equal thickness in parallel relation equidistantly spaced from each other by clear lines equal in thickness to the black lines;

exposing photosensitive material to the first combination of light via the line screen negative to provide a first exposure;

optically superimposing the second transparency provided by the stereo camera and the third transparency on each other to provide a second combination of light;

shifting the line screen negative in position by the thickness of a black line thereof on the first exposure;

re-exposing the photosensitive material to the second combination of light via the shifted line screen negative to expose the line of the first exposure covered by the black lines of the negative in providing the first exposure to provide a complete exposure;

printing the complete exposure as a single print; and

lenticulating the print whereby it appears to be three-dimensional to a human eye.

4,056,317

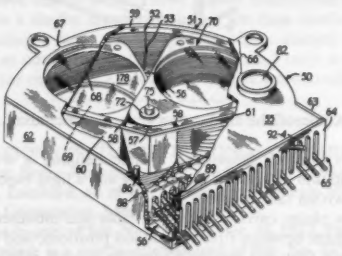
APPARATUS FOR SELECTIVELY MODULATING THE COLOR OF LIGHT BEAM PATHS OF PHOTOGRAPHIC COLOR RECORDERS

John Hopkins Lewis, 32 Franklin Road, Teaneck, N.J. 07666

Filed Feb. 11, 1976, Ser. No. 657,254

Int. Cl.[2] G03B *27/32*

U.S. Cl. 355—32 **11 Claims**



1. Apparatus for selectively inserting into and withdrawing color absorption filters from the light beam paths of photographic color recorders; comprising

1. a housing defining a plural-section chamber and having opposed and spaced sidewalls with the latter in an operational section of the chamber provided with opposite windows closed by suitable optical transparencies through which the light beam path of a photographic color recorder may extend upon suitable beam-intercepting support of said housing in a certain orientation dictated by the predetermined path of such beam;
2. a stack of planar color absorption filters, having substantially uniform indices of refraction and arranged in groups within a storage section of the chamber located offset from the windowed operational section with those in one group being of the color cyan, those in a second group being of the color magenta and those in the third group being of the color yellow;
3. manipulative means capable of moving individually and selectively each such filer from the stack in the storage section to positions of stacking between said windows substantially normal to the light beam path extending therethrough and back again into the storage section;
4. means sealing in a liquid-tight manner at least the sides and bottoms of the entire chamber including its storage and operational section; and
5. a body of transparent colorless liquid having an index of refraction substantially equal to that of the filters and located in the chamber and its sections in a quantity to maintain immersion therein of said filters in their positions of storage and operation and movements therebetween.

4,056,318

OPTICAL SYSTEM FOR USE IN MICROFILM READING AND PRINTING APPARATUS

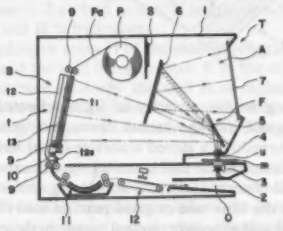
Yutaka Watanabe, Tokyo, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 14, 1976, Ser. No. 676,887

Claims priority, application Japan, Apr. 22, 1975, 50-55644[U]

Int. Cl.[2] G03B *27/32, 21/28*

U.S. Cl. 355—45 **6 Claims**



1. An optical system for use in a microfilm reading and printing apparatus which comprises a lens assembly for selectively projecting, on an enlarged scale, image light of information on a microfilm illuminated by a light source onto an exposure station of a printing section and onto an observation screen of the microfilm reading and printing apparatus, a first reflecting mirror, a second reflecting mirror, said first reflecting mirror being displaceable between a first position thereof for projecting said image light through said lens assembly onto said exposure station and a second position thereof for projecting said image light onto said second reflecting mirror, said second reflecting mirror being displaceable between a first position thereof for projecting said image light from said first mirror at said second position onto said observation screen and a second position thereof spaced away from a path of said image light between said first reflecting mirror at said first position and said exposure station, said first and second reflecting mirrors being disposed for intercepting outside light entering from said observation screen when the former is at said first position and the latter is at said second position, and driving means for positioning said first reflecting mirror to said second position and said second reflecting mirror to said first position during reading, and also for positioning said first reflecting mirror to said first position and said second reflecting mirror to said second position during printing.

4,056,319

MICROFILM RECORDING APPARATUS

Klaus Mischo, Munich, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Sept. 29, 1975, Ser. No. 617,446

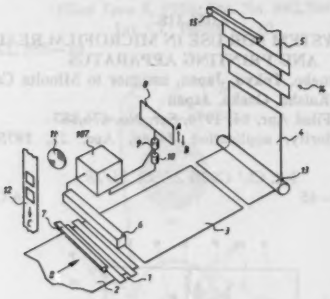
Claims priority, application Germany, Sept. 27, 1974, 2446240

Int. Cl.[2] G03B *27/74, 27/78*

U.S. Cl. 355—68 **16 Claims**

1. Arrangement for making copies on microfilm of a sequence of originals having lengths varying between a maximum and a minimum length comprising, in combination, first

transport means transporting said sequence of originals along a predetermined path in the direction of said length, past a measuring station and a filming station provided with exposure control means spaced from said measuring station by a predetermined distance along said path corresponding to said maximum length; scanning means for illuminating said original, scanning said original along successive scan lines extending transverse to the transport direction of said original and effecting the scanning along each such scan line progressively along the length of the scan line, and furnishing scanning signals



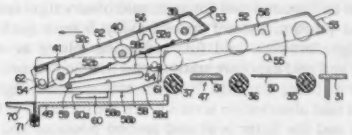
corresponding to the quantity of light reflected by the so-scanned original; storage means connected to said scanning means, for furnishing a stored scanning signal having a predetermined relationship to said scanning signals; exposure control means at said filming station for addressing said storage means just prior to the time said original reaches said filming station and atjusting said exposure control means in dependence upon said stored scanning signal; and reset means for resetting said storage means after said original has passed through said filming station.

4,056,320

COPYING MACHINE

Hideaki Mochimaru, Yokohama, and Yugoro Kobayashi, Suginami, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed May 6, 1976, Ser. No. 683,762
Claims priority, application Japan, May 10, 1975, 50-55591
Int. Cl.[2] G03B *27/62*
U.S. Cl. 355—75 **7 Claims**



1. A copying machine, which permits a selective use of either a single sheet original or a file original comprising:

a. main body

b. a plurality of drive rollers disposed on the underside of a path of movement of an image bearing surface of an original to be copied with their axes extending transversely of said path, and mounted on said body for rotation,

c. marginal driven rollers each mounted on said body on the other side of said path for cooperation with end portions of a respective drive rollers,

d. a transparent sheet member arranged to be fed between said drive rollers and said marginal driven rollers from an inlet of said path, thereby to be moved along said path while receiving a file original thereon,

e. intermediate driven rollers, each engageable with the remaining intermediate portions of said drive rollers on the other side of said path, to form nips therebetween for moving a single sheet original fed from said path inlet,

f. frame means, mounting said intermediate driven rollers thereon, movable between a first position, in which said intermediate driven rollers engage with respective drive rollers, and a second position, in which it is closely juxtaposed to the region in which said drive rollers are disposed along a direction parallel to said path while its top extremity is below an extension of said path,

g. guide means guiding the movement of said frame means between said first and second positions without substantial change in the orientation of said frame means,

h. handle means provided at a front end of said frame means corresponding to said path inlet to be gripped by an operator to manually move said frame means between said first and second positions, and

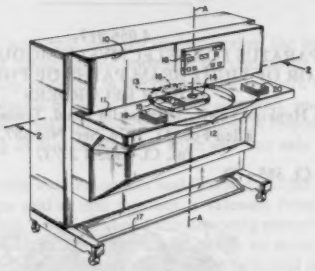
i. means for scanning an image of an original during its movement along said path.

4,056,321

MICROFICHE DUPLICATING APPARATUS

Karl H. Gensike, Northridge; Robert C. Marsh, El Monte, and John D. Reinhard, Los Angeles, all of Calif., assignors to Dymat Photomatrix Corporation, Santa Monica, Calif.

Filed June 25, 1976, Ser. No. 700,046
Int. Cl.[2] G03B *29/00, 27/04*
U.S. Cl. 355—99 **5 Claims**



1. A microfiche duplicating apparatus including, in combination:

a. a housing supporting a table defining a work loading station exterior of the housing and a light exposure station within said housing;

b. a platen carrier set in said table and mounted for movement between first and second positions, said carrier having first and second platens in spaced relationship such that when said carrier is in said first position, the first platen is exterior of said housing adjacent to said work loading station and the second platen is positioned within said housing at said light exposure station, and when said carrier is in said second position, said first platen is positioned within said housing at said light exposure station and said second platen is exterior of said housing adjacent to said work loading station;

c. a contacting platen positioned in said housing and movable into opposed engaging relationship with that one of the first and second platens positioned at said light exposure station;

d. a reel of microfiche film mounted in said housing;

e. a driving capstan means in said housing receiving the microfiche film from said reel for moving successive given lengths of said film to said light exposure station between said contacting platen and that one of said first and second platens positioned at said light exposure station;

f. roller means in said housing between said reel and driving capstan means for guiding movement of said microfiche film from said reel to said light exposure station, said roller means including a lever having a pair of rollers mounted

on opposite ends and being centrally pivoted to said housing, said microfiche film from said reel passing between said pair of rollers; and biasing means biasing said lever to a first position such that pulling of the film over the pair of rollers by said driving capstan means swings said lever to a second position against the bias of said biasing means, said biasing means thereafter returning said lever to said first position, a given length of microfiche film corresponding to each of said given lengths being drawn from said reel by said pair of rollers upon return of the lever to its first position so that the driving capstan means in moving said microfiche film through said successive lengths always pulls against the same resistance forces exerted by said biasing means independently of the amount of film on said reel;

g. a light source in said housing for exposing the given length of said microfiche film positioned at said light exposure station;

h. cutting means in said housing for cutting said successive given lengths of said film after the same have been moved from said light exposure station to provide exposed microfiche;

i. film developing chamber means in said housing for successively receiving the cut lengths of microfiche and developing the same; and

j. motor means for moving said platen carrier and driving said driving capstan means whereby a first master microfiche of which a duplicate is to be made may be positioned at said work loading station on said first platen and moved into said housing to effect a contact print with one of said given lengths of microfiche film at said light exposure station when said light source is energized, and whereby a second master microfiche may be positioned on said second platen during the time of exposure to said light source of said first master microfiche and moved into said housing for exposure with a next successive length of microfiche film during which time said first platen is available at said work loading station for removal of said first master microfiche and insertion of a third master microfiche, successive copies of successive master microfiches being made in a similar manner such that the time involved in duplicating a large number of microfiche masters is reduced as compared to the time required if only a single platen for receiving a microfiche master were available.

4,056,322

PREPARATION OF ETHERS OF MONOSACCHARIDES

Paul Gordon; Bruce Ronsen, both of Chicago, and Shrikant V. Kulkarni, Lombard, all of Ill., assignors to Strategic Medical Research Corporation, Murray, Utah

Continuation-in-part of Ser. No. 424,786, Dec. 14, 1973, Pat. No. 3,939,146, which is a continuation-in-part of Ser. No. 337,134, March 1, 1973, Pat. No. 3,939,145. This application Mar. 28, 1975, Ser. No. 563,080

Int. Cl.[2] C07H *15/04, 5/06*

U.S. Cl. 536—4 **20 Claims**

1. In a method of preparing an ethereally substituted monosaccharide comprising the step of reacting

1. a monosaccharide derivative having the general formula A-O-H, wherein O is oxygen, H is hydrogen and A is the residue of a monosaccharide selected from the group consisting of pentoses, hexoses and heptoses which has been derivatized with at least one substance selected from the group consisting of (1-a) at least one alcohol containing 1–18 carbon atoms to produce an acetal group at the site of at least one available hydroxyl residue. (1-b) at least one aldehyde containing 1–18 carbon atoms to produce at least one acetal group at the site of at least one available hydroxyl residue, (1-c) at least one ketone containing 1–18 carbon atoms to produce at least one ketal group at the site of at least one available hydroxyl residue, and (1-d) at least one organic acid residue containing 1–18 carbon atoms to produce an ester group at the site of at least one available hydroxyl residue, the said hydrolyzable acetal groups (1-a) and (1-b), ketal group (1-c) and ester group (1-d) being removable from said A by hydrolysis in an acidic aqueous medium having a pH value less than 7,

2. an organic halide having the general formula Y-X, wherein X is selected from the group consisting of chlorine, bromine and iodine and Y is selected from the group consisting of (2-a) cyclic monovalent nitrogen containing organic radicals and residua free of carbonyl oxygen and (2-b) monovalent organic radicals and residua having the general formula $—R_1—B$, wherein B is selected from the group consisting of

$$—N(—R_2,\ |\ R_3$$

$—O—R_4$ and $—S—R_4$, R_1 is a divalent organic radical having a linear carbon chain length of about 1–7 carbon atoms, R_2 and R_3 are selected from the group consisting of —H, —OH, —SH, halogen and monovalent organic radicals and residua having a linear carbon chain length of about 1–7 carbon atoms, R_4 is selected from the group consisting of —H and monovalent organic radicals and residua having a linear carbon chain length of about 1–7 carbon atoms, N is nitrogen, O is oxygen, S is sulphur and H is hydrogen,

the said hydrogen atom H of the monosaccharide derivative A-O-H and the said halogen atom X of the organic halide being reactive whereby the said H is replaced by Y to produce an ethereally substituted monosaccharide derivative having the general formula A-O-Y wherein A and Y are as above defined,

the improvement which comprises reacting said monosaccharide derivative (1) and the said organic halide (2) at an elevated reaction temperature below the thermal decomposition temperature thereof while dissolved in an anhydrous organic solvent in the present of a solid anhydrous strong inorganic base of a metal selected from the group consisting of the alkali metals and the alkaline earth metals and in the presence of a dehydrating agent which is a scavenger for water whereby anhydrous reaction conditions are maintained throughout the reaction.

4,056,323

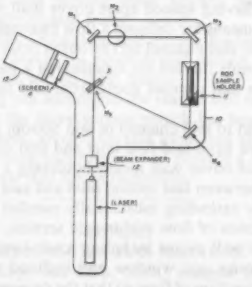
INTERFEROMETER OPTICAL SYSTEM

Jacques E. Ludman, 98 Old Lowell Road, Westford, Mass. 01886

Filed Apr. 2, 1975, Ser. No. 564,498

Int. Cl.[2] G01B *9/02*

U.S. Cl. 356—106 R **8 Claims**



1. An interferometer optical system for measuring the positions of first and second space subject mirrors comprising,

a source of coherent radiation directed along an initial path,

a target for the radiation,

means in said path for splitting said radiation into two substantially equal beams, a first beam and a second beam,

first optical means including first, second and third mutually perpendicular mirrors for directing the first beam normal to the first spaced mirror,

second optical means for directing the second beam normal to the second spaced mirror,

the first optical means serving to direct the first beam which reflects from the first spaced mirror back to the beam splitting means,

the second optical means serving to direct the second beam which reflects from the second spaced mirror back to the beam splitting means, and

at said beam splitting means, at least a portion of said reflected first and second beams are superimposed and directed to said target,

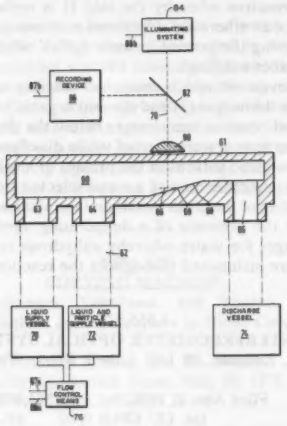
whereby light patterns appearing on the target are indicative of the positions of the first and second subject mirrors.

4,056,324

APPARATUS FOR COUNTING AND/OR MEASURING PARTICLES SUSPENDED IN A FLUID MEDIUM

Hildegard Göhde, von-Stauffenberg-Str. 40, 4400 Munster, Germany

Filed May 5, 1976, Ser. No. 683,340
Claims priority, application Germany, May 10, 1975, 2521236
Int. Cl.[2] G01N *21/00*
U.S. Cl. 356—246 **8 Claims**



1. In an apparatus for counting and/or measuring particles suspended in a fluid medium,

a flow cell having spaced apart cover wall means and bottom wall means for defining a flow channel therebetween,

a first inlet to said channel and an outlet from said channel at opposite ends thereof for establishing a general direction of flow in said channel going from said first inlet to said outlet,

a second inlet to said channel in said bottom means between and spaced from said first inlet and said outlet,

means in said cover wall means bordering a section of said channel between said second inlet and said outlet defining a window extending substantially parallel with said general direction of flow within said section,

said bottom wall means including a substantially plane surface opposite said window and inclined relative to said general direction of flow so that the cross-sectional area of said channel is reduced in said general direction, and

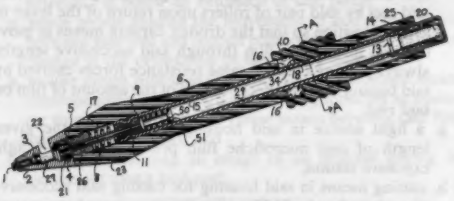
observation means having an axis of observation passing through said window for defining an observation area between said window and adjacent said inclined plane surface, said observation area being a plane extending from said inclined plane surface into said channel parallel to said window.

4,056,325

MECHANICAL PENCIL

Tadaaki Maruyama, 1089-130 Nedo, Abiko, Chiba, Japan (270-11)

Filed Apr. 5, 1976, Ser. No. 673,884
Claims priority, application Japan, Apr. 7, 1975, 50-41191
Int. Cl.[2] B43K *21/16, 21/00*
U.S. Cl. 401—65 **5 Claims**



1. A push-out type mechanical lead pencil comprising:

an outer tube means for forming a pencil body;

a bulb at the lower end of said outer tube means where a writer's fingers are positioned while writing;

a hollow tip mount at the forward end of said outer tube means and extending therefrom, the forward portion extending from said outer tube means being threaded;

a hollow tip member threaded onto the forward end of said tip mount;

a collet chuck means expandable within and extending rearward from said hollow tip for holding lead therein;

an inner tube means longitudinally moveable coaxially within said outer tube means for holding lead therein and for forcing against said collet chuck;

push button means at the end of said inner tube means extending outside said outer tube means for moving said inner tube means;

said outer tube means further having at least one longitudinal slot therein parallel to the axis of said tube at the portion of said outer tube means where the web of the writer's thumb and index finger contact said outer tube means; and

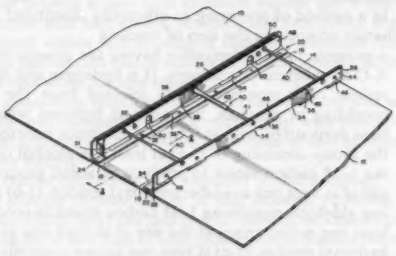
a slider at least partially circumferentially surrounding and slidable along said outer tube member, said slider being fitted through said slot in said outer tube means and contacting said inner tube means.

4,056,326

LOOSE LEAF BINDER

Kenneth Z. Crawford, Crawfordsville, Ind., assignor to Crawford Industries, Inc., Crawfordsville, Ind.

Filed Aug. 6, 1975, Ser. No. 602,229
Int. Cl.[2] B42F *13/30*
U.S. Cl. 402—30 **8 Claims**



4. A loose leaf binder, comprising

stiff front and rear covers and a stiff backbone of fixed width to which the covers are hinged on hinge lines at their inner edges for movement between a closed position in

which the covers lie in spaced face-to-face relation and an open position in which the covers are substantially coplanar with the backbone,

a post-mounting unit fixed to the inner face of each cover adjacent its hinged edge, each such unit being an elongated member of stiff plastic material having an elongated base strip along one edge thereof and fixed to the cover with a free edge adjacent the cover hinge line and extending outwardly of said hinge line to an outer edge spaced from the cover hinge line, a post-supporting strip along the opposite edge thereof, and a web extending from the outer edge of the base strip to the post-supporting strip and containing at least two spaced flex lines about which the edge strips may swing relative to each other,

post mechanism including a plurality of extensible posts having mounting means at their ends secured to said post-supporting strips in a manner so as to hold such strips in substantially parallel spaced planes perpendicular to said posts, said mounting means including post-supporting bars lying flat against the outer faces of said post-supporting strips,

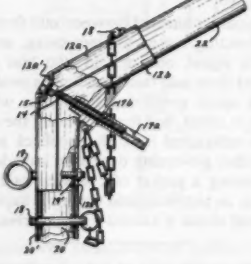
the arrangement being such that in the closed position of the covers, the post-supporting bars lie substantially flat against the inner faces of the covers, the post-supporting strips lie substantially flat against such bars, outwardly from and in offset parallel relation with the edge strips to which they are connected by the webs, so that there is a leaf-receiving space between the post-supporting strips, and the posts are in shortened state and generally perpendicular to the covers, and as the covers are swung outward toward their open position, the webs of the post-mounting units are flexed on each of their spaced flex lines, and the post-supporting strips are held in substantially parallel spaced relation but are carried outward with the outward-swinging outer edges of the base strips so as to extend and lift the posts and widen the leaf-receiving space between the post-supporting strips and said web portions swing upward from the covers to inclined positions between the base and post-mounting strips.

4,056,327

CORNER CONNECTOR

John J. Daus, Jr.; Henry E. James, and Thomas L. Reinhart, all of Evansville, Ind., assignors to Anchor Industries, Inc., Evansville, Ind.

Filed Feb. 19, 1976, Ser. No. 659,410
Int. Cl.[2] F16L *41/00*
U.S. Cl. 403—172 **1 Claim**



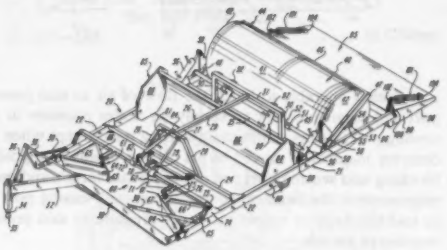
1. A two-part corner member defined as an outer member and an inner member, said outer member and said inner member each arranged to include four corresponding and converging arm sections which fit together to encircle and receive tubular frame members, two of said arm sections being at a right angle to each other and in the same horizontal plane, another of said arm sections being vertically disposed, and the other of said arm sections angling upwardly and inwardly with respect to said two of said arm sections, and independent bolt and nut fastening means extending through said outer member and said inner member at the area of convergence of said arm sections selectively securing said outer member and said inner member in an assembled relationship.

4,056,328

SNOW GROOMER FOR SNOWMOBILE TRAILS

Loren R. Maxey, 615 S. Loomis, Fort Collins, Colo. 80521

Filed Feb. 17, 1977, Ser. No. 769,733
Int. Cl.[2] E01C *19/41*
U.S. Cl. 404—96 **5 Claims**



1. Apparatus adapted to be towed by a dirigible tracked vehicle for grooming snow on snowmobile trails, said apparatus comprising, in combination:

a generally horizontal main frame;

a hitch supporting the forward end of said frame adapted for towing engagement with the tracked vehicle;

means on said hitch for raising and lowering the same relative to the vehicle thereby to raise or lower the forward end of said main frame relative to the snow surface being groomed;

a packing roller mounted transversely within and supporting the rear end of said frame and for compacting the snow surface being groomed;

means for adjusting the position of said main frame relative to the packing roller, thereby to raise and lower the rear end of said main frame relative to the snow surface being groomed;

a moldboard scraper mounted transversely within said main frame in front of said packing roller for scraping and leveling the snow surface being groomed;

means adjustably mounting said moldboard scraper on said frame for raising and lowering said moldboard relative to the snow surface being groomed;

cutting blades mounted within the forward end of said frame for cutting and moving snow toward the longitudinal center axially of said frame;

means adjustably mounting said cutting blades on said main frame for varying the position and cutting depth of said blades reltive to said main frame;

and a floating pan secured to the rear of said main frame for smoothing the snow surface which has been cut by said cutting blades, leveled by said molboard and compacted by said packing roller thereby to provide a smoothed and leveled snow trail for snowmobiles.

4,056,329

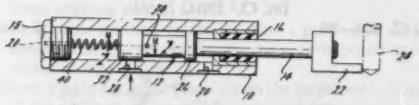
DETECTION SYSTEM FOR MACHINE TOOLS

Louis James Perry, Oak Park, Mich., assignor to Invo Spline, Inc., Warren, Mich.

Filed Mar. 8, 1976, Ser. No. 664,681
Int. Cl.[2] B23B *49/00*
U.S. Cl. 408—6 **8 Claims**

1. In a detecting device for use with a machine operable through a cycle of operation upon energization of a pressure responsive switch, the improvement comprising a pneumatically operable detecting device including a movable detecting

member, means biasing said detecting member to an extended position into engagement with a target such as a tool bit or workpiece the presence of which is necessary to proper operation of the machine, said detecting device including a pressure port and a sensing port, and a control system including a source of air under pressure, means operable upon energization of said control system for supplying air under pressure to said pressure port to hold said detecting member in retracted position, means operable to block the flow of air to said pressure port and simultaneously to supply air under pressure to said sensing port, means venting said sensing port except when said detector member is moved by its biasing means to a position blocking said sensing port and engaging said target, and means responsive to the build-up of pressure at said sensing port due to said blockage to supply air under pressure to said pressure responsive switch.



4,056,330

METHOD FOR ADJUSTING THE OUTPUT OF A PUMP PROVIDED WITH AN ADJUSTABLE SPRAY CONE WITH MOVABLE BLADES

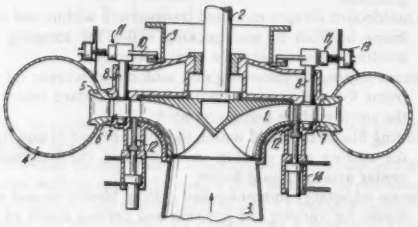
Jean Lieber, Geneva, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Sept. 29, 1975, Ser. No. 617,798

Claims priority, application Switzerland, Oct. 3, 1974, 13293/74

Int. Cl.[2] F01D *21/00*

U.S. Cl. 415—1 **1 Claim**



1. A method for adjusting the output of a machine having a rotor which is operable both as a pump or turbine, said machine including a diffuser provided with normally locked movable directing blades and a sleeve valve, said method consisting of unlocking, adjusting and re-locking the angular setting of said blades to change the amount of power produced without shutting off the intake of water to said rotor when the machine is used as a turbine, and when said machine is used as a pump, said method consisting of driving said rotor, continuing the driving of said rotor preparatory to adjusting the output of said pump, closing fully said sleeve valve to put the pump under still water conditions, unlocking said movable directing blades without stopping the rotor, adjusting said blades to adjust the subsequent throughput of the pump, relocking said blades and then opening said sleeve valve to initiate the operation of an adjusted throughput of the pump.

4,056,331

TURBINE CONTROL SYSTEM

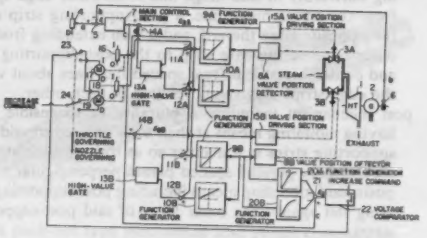
Seiko Sato, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 27, 1976, Ser. No. 652,849

Claims priority, application Japan, Jan. 31, 1975, 50-12361

Int. Cl.[2] F01B *25/04*

U.S. Cl. 415—15 **9 Claims**



1. A turbine control system for changing two speed governing operations of a steam turbine from a throttle governing operation to a nozzle governing operation and vice versa by controlling a plurality of steam control valves on the basis of a main control flow-rate request signal, which system comprises:

a. first group of function generators for the throttle governing operation operatively coupled to said steam control valves for producing function outputs, as throttle governing feedback signals, in response to the opening degrees of said steam control valves, respectively;

b. a second group of function generators for the nozzle governing operation operatively coupled to said steam control valves for producing function outputs, as nozzles governing feedback signals, in response to the opening degrees of said steam control valves, respectively;

c. bias subtracting means connected to said function generators of the first and second groups for subtracting two bias signals from said feedback signals produced by said function generators of the first group and said feedback signals produced by said function generator of the second group to produce output signals, respectively;

d. a high-value gate circuit provided for each steam control valve for passing the higher of said output signal applied thereto by said bias subtracting means;

e. first means operatively connected to said steam control valves for producing a difference signal between said main control flow-rate request signal and the sum of signals representative of actual flow-rates of said steam control valves; and

f. second means connected between said first means and said bias subtracting means for increasing, according to said difference signal, one of said two bias signal which is subtracted from said feedback signals produced for one of said two speed governing operations which is not one intended to effect, and for decreasing the other bias signal which is subtracted from the feedback signals produced for the other governing operation intended to effect,

whereby during a period of changing said two governing operation, an output of said turbine is kept unchanged and no thermal shock is caused to said turbine.

4,056,332

COOLED TURBINE BLADE

Beat Meloni, Zurich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 5, 1976, Ser. No. 683,488

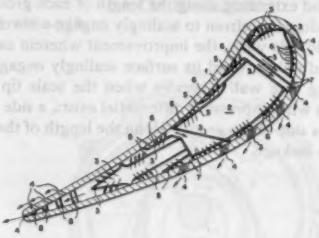
Claims priority, application Switzerland, May 16, 1975, 6370/75

Int. Cl.[2] F01D *5/18*

U.S. Cl. 416—97 A **3 Claims**

1. A turbine blade including a cavity extending generally

longitudinally therein and into which air for cooling the interior wall of the blade is admitted, a plurality of inserts disposed in the cavity adjacent the interior wall of the blade and arranged in a row between the leading and trailing edges thereof, each said insert being constituted by a plurality of stepped overlapping walls with air passages therethrough and which



establish therebetween corresponding adjacent air turbulence and cooling spaces interconnected by said passages and bounded respectively at one side by the interior blade wall, the cooling air passing from said cavity into and through the cooling spaces of each said insert in succession for impingement upon the blade wall and being discharged to the exterior of the blade through an outlet port formed in the blade wall.

4,056,333

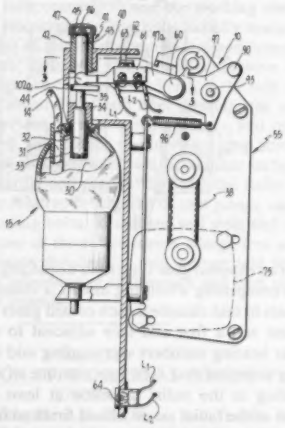
INTRAVENOUS FEEDING PUMP FAILURE ALARM SYSTEM

Ingemar H. Lundquist, Oakland, Calif., assignor to Valleylab, Boulder, Colo.

Continuation of Ser. No. 488,581, July 15, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,656

Int. Cl.[2] F04B *21/00;* **A61M** *5/16;* **F04B** *49/10*

U.S. Cl. 417—44 **14 Claims**



1. In combination with an intravenous feeding pump having:

a. pumping chamber having an inlet and an outlet,

b. inlet valve means disposed in the inlet and outlet valve means disposed in the outlet,

c. a plunger serving as a pumping member projecting through the wall of said chamber and having an outer end portion always extending out of said chamber whereby the plunger can be reciprocated between first and second positions in said chamber,

d. resilient biasing means for returning said plunger to the first position,

e. a pump actuator having means adapted to urge the outer end of said plunger to the second position against the force of the resilient biasing means and;

an alarm system comprising:

1. means for sensing failure of said plunger to return to its inoperative position, and

2. signal means operated by said sensing means.

4,056,334

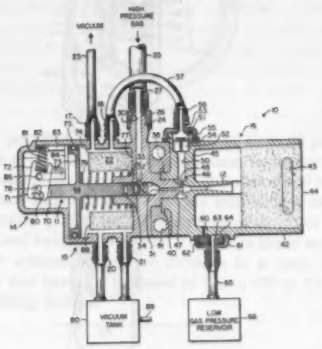
VACUUM SYSTEM

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

Filed May 12, 1975, Ser. No. 576,612

Int. Cl.[2] F04F *5/52*

U.S. Cl. 417—189 **16 Claims**



1. A demand operated vacuum pump comprising:

a. a venturi tube;

b. means including a passageway for supplying compressed gas to said venturi tube;

c. means for forming a vacuum chamber;

d. conduit means for exhausting the air from said vacuum chamber and connected to the throat of said venturi tube;

e. unitary piston means disposed in said vacuum chamber and capable of moving from one end position to the other, said piston means having a valving portion capable by said moving of opening and closing said passageway to permit or prevent the compressed gas from entering said venturi tube;

f. spring means associated with said piston means and disposed in said housing for urging said piston into one end position, while an existing vacuum tends to urge said piston in the other end position, thereby to close off the supply of compressed gas; and

g. means coupled to said piston means for causing said piston means to rapidly snap from one end position to the other.

4,056,335

SUBSURFACE PUMPING INSTALLATION FOR HANDLING VISCOUS OR SAND-LADEN FLUIDS

Walter S. Secrist, Dallas, Tex., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 29, 1976, Ser. No. 653,425

Int. Cl.[2] F04B *39/00*

U.S. Cl. 417—431 **16 Claims**

1. In a subsurface pumping installation which includes:

parallel power and production tubing strings;

a pump barrel at the lower end of said power tubing string;

sucker rods extending down said power tubing string;

a plunger movable up and down within said barrel;

means connecting said plunger with said sucker rods;

a crossover affording communication between said pump barrel and said production tubing string;

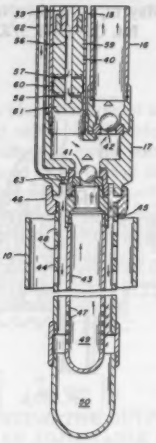
said power tubing string being adapted to carry diluent from the surface into a well;

means for transmitting at least a portion of the diluent to said barrel beneath said plunger and thence to said crossover; and

valves for admitting well fluid to said crossover and discharging it therefrom on opposite movements of said plunger;

said production tubing string being adapted to carry a mixture of well fluid and diluent to the surface;

the improvement comprising:



a landing shoe attached to one of said tubing strings at the lower end thereof;

means carried by the other of said tubing strings at the lower end thereof stabbed and locked in said landing shoe;

said landing shoe having upper edges which slope downwardly toward the central axis of said other tubing string to guide said last-named means into the landing shoe as said other tubing string is lowered; and

tubular means connecting said crossover and said landing shoe.

4,056,336

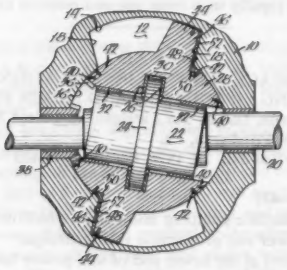
APEX SEALS FOR SLANT AXIS ROTARY MECHANISMS

James A. Ritchie, Hampton-in-Arden, England, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 2, 1976, Ser. No. 702,168

Int. Cl.[2] **F01C** *1/02, 19/00;* **F04C** *27/00*

U.S. Cl. 418—51 **6 Claims**



1. In a slant axis rotary mechanism including a housing defining a chamber having radially inner and outer spherical walls interconnected by opposed, generally radially extending side walls, a shaft journalled in said housing and having an angularly offset portion within said chamber, a rotor within said chamber journalled on the angularly offset portion and having a spherical hub and a peripheral, radially outwardly extending flange having plural apexes on each side thereof, an apex seal receiving groove at each apex extending radially the length of the flange and into the hub, and an apex seal loosely received in and extending along the length of each groove and further extending therefrom to sealingly engage a corresponding one of said side walls, the improvement wherein each said seal is tapered only toward its surface sealingly engaging the corresponding side wall whereby when the seals tip within their grooves when a pressure differential exists, a side thereof may contact a side of the groove along the length of the seal to minimize gas leakage.

4,056,337

EXTERNAL GEAR TYPE FLUID DISPLACING MACHINE WITH BEARING GAP

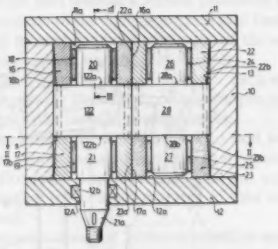
Jürgen Zorn, Korntal; Jan Vlemmings, Hemmingen; Karl-Heinz Müller, Gerlingen; Siegfried Mayer, Vaihingen, Enz; Wilhelm Dworak, Stuttgart; Eugen Hartmann, Hausen; Martin Fader, Bieselsberg; Wolfgang Talmon, Otisheim; Claus Jöns, Munchingen; Ivan Sauer, Schwieberdingen, and Paul Bosch, Ludwigsburg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 17, 1975, Ser. No. 596,738

Claims priority, application Germany, Aug. 10, 1974, 2438512

Int. Cl.[2] **F01C** *19/08;* **F03C** *3/00;* **F04C** *15/00*

U.S. Cl. 418—131 **13 Claims**

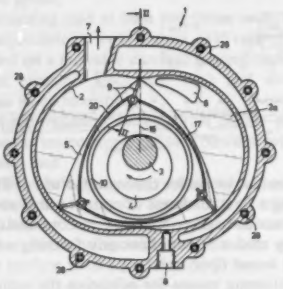


1. In an external gear type fluid displacing machine, a combination comprising a housing having a chamber; a pair of mating gears in said chamber, each of said gears having at least one trunnion and a first end face adjacent to said trunnion; and annular bearing members surrounding said trunnions and each having a second end face opposite one of said first end faces extending in the radial direction at least over a substantial portion of the radial extent of said first end face and also having an outer peripheral surface, said housing having internal surfaces adjacent to and defining with the outer peripheral surfaces of the bearing members, when the machine is not in operation, arcuate gaps extending at least over a major portion of the length of said bearing members and having cross-sectional areas gradually increasing toward the end faces of the respective gears, said bearing members being in operation subject to tilting with resulting radial upsetting and axial elongation of the bearing members, said tilting causing formation of axial clearances between said first and second end faces which compensate for said axial elongation and at least reduce frictional wear between said first and second end faces.

4,056,338
ROTARY PISTON ENGINE

Dankwart Eiermann, Lindau, Germany, assignor to Wankel GmbH, Lindau, Germany

Continuation of Ser. No. 374,045, June 27, 1973, abandoned.
This application Aug. 19, 1976, Ser. No. 715,662
Claims priority, application Germany, July 5, 1972, 2232997
Int. Cl.[2] F04C *27/00*
U.S. Cl. 418—119 13 Claims



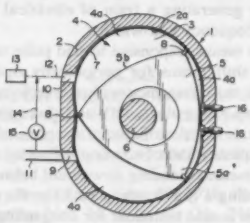
1. A rotary piston machine for operation by introduction of air into a compression chamber, said machine comprising a housing having a multi-arc peripheral inner surface of epitrochoidal cross section and end walls in planes perpendicular to said peripheral wall, and a multi-corner piston rotatable in said housing with its corners in sealing contact with said peripheral surface to form a plurality of working chambers, said piston having radial planes extending through the axis of said piston and said corners, one of said end walls of said housing having an inlet opening adjacent the peripheral wall to admit air under pressure into a working chamber, said rotary piston having a plurality of seal strips on each end wall to engage said end walls of the housing, said seal strips extending substantially circumferentially and disposed radially inwardly of the radial inner limit of said inlet opening to seal the working chambers outwardly of said seal strips, sealing bolts radially inwardly of the radial inner limit of said inlet opening and positioned rearwardly in rotational direction of said piston relative to the radial planes through the corners of said piston, the path of said sealing bolts lying inwardly of said inlet opening, the ends of said seal strips intersecting said bolts, a corner seal on each corner of said piston, said corner seal having a strip across the corner of said piston engaging said peripheral inner surface and legs extending inwardly and rearwardly from the radial plane through the corner relative to rotation of said piston, said legs intersecting said sealing bolts, so that the seal strip and corner seal leg on the corner of the piston leaves a large free area on the end of said piston forward of said corner seal leg and provides maximum admission of air through said inlet opening in the compression chamber.

4,056,339
ROTARY PISTON TYPE INTERNAL COMBUSTION ENGINES

Kunio Doi, Hiroshima; Kozo Koike, Kure, and Toshiro Sasaki, Hiroshima, all of Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Oct. 15, 1976, Ser. No. 732,851
Claims priority, application Japan, Oct. 16, 1975, 50-125007
Int. Cl.[2] F01C *21/00*
U.S. Cl. 418—178 5 Claims

1. Rotary piston engine comprising a casing which comprises a rotor housing having an inner wall of trochoidal configuration and a pair of side housings gas-tightly secured to the opposite sides of the rotor housing to define a trochoidal cavity therein, a substantially polygonal rotor disposed in the cavity for rotation with apex portions in sliding contact with the inner wall of the rotor housing so that working chambers of variable volume are defined in said cavity between said inner wall of the rotor housing and flanks of the rotor, intake means for introducing intake gas into one of said working chambers which is in intake stroke, exhaust means for exhausting gas from another working chamber which is in exhaust stroke, said rotor housing being applied on the inner wall thereof with pin-point type porous chromium plating mainly including

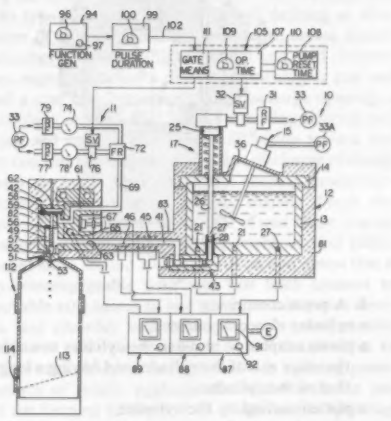


discontinuous pores and having a porosity of 10 to 60 percent and a hardness of 930 to 1200 in Vicker's scale, said rotor being provided on each of the apex portions with an apex seal having a sliding surface adapted to be brought into sliding contact with the chromium plating on the inner wall of the rotor housing, said apex seal being constituted by cast-iron based material with 50 to 70 volume percent of carbides in at least in the sliding surface and having a hardness of 700 to 900 in Vicker's scale at the sliding surface.

4,056,340
PRILLING APPARATUS

Samuel H. Yalkowsky, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed July 1, 1976, Ser. No. 701,892
Int. Cl.[2] B22D *23/08*
U.S. Cl. 425—10 13 Claims



1. A prilling apparatus for prilling pharmaceuticals and the like, comprising:

means for supplying a melted mixture of a pharmaceutical and a vehicle at a preselected pressure and at a temperature less than the decomposition temperature of the pharmaceutical and wherein the vehicle is a solid at normal room temperature;

gun means including

a. a melt chamber connected to said supply means for receiving said melt mixture,

b. a substantially downwardly directed nozzle communication with said chamber,

c. a valve member and biasing means normally urging said valve member to a closed condition blocking said communication between said chamber and nozzle to prevent melt material flow out of said nozzle,

d. shift means actuable for shifting said valve member to an open condition permitting said pressurized melt mixture to escape the gun through said nozzle;

means for generating a train of electrical pulses of preselected frequency and width;

transducer means responsive to said pulse train and coupled to said shift means for periodically opening said valve means at said frequency with a preselected duration controlled by said pulse width and therewith ejecting from said nozzle a series of spaced droplets of melt mixture at said frequency and of size controlled by said pulse width;

container means extending downward below said nozzle and surrounding a gravity drop path for the droplets; and

fluid means in said container for congealing said droplets as they fall along said path to form same into substantially spherical prills.

4,056,341

PRESSES

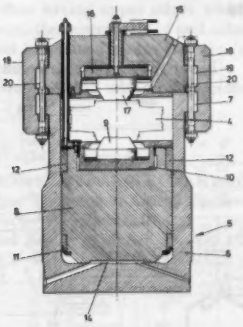
Anthony John Moore, Farms Splitrock, Ezulweni, Swaziland, South Africa

Filed Aug. 30, 1976, Ser. No. 718,471

Claims priority, application South Africa, Sept. 5, 1975, 75/5683

Int. Cl.[2] B29C *3/00*; B30B *11/32*

U.S. Cl. 425—77 **5 Claims**



1. A press comprising:

a cylinder closed at one end,

a piston adapted to move in the cylinder towards and out of the other end of the cylinder and having a length less than that of the cylinder,

a platten carried by the cylinder,

a circumferential flange around the other end of the cylinder and integral with the cylinder,

a lid adapted to rest on the other end of the cylinder to close it off,

a platten carried by the lid and facing the platten on the cylinder,

a circumferential flange on the lid, integral with the lid and registering with the cylinder flange when the lid is closed, and clamping segments movable to sandwich the flanges between them to form a continuous ring around the flanges.

4,056,342

FIBERBOARD MANUFACTURE

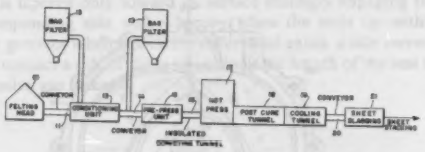
Henry A. Fremont, Wyoming, and Walter Phalti Lawrence, Hamilton, both of Ohio, assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 380,334, July 18, 1973, Pat. No. 3,969,459.

This application Apr. 14, 1976, Ser. No. 676,715

Int. Cl.[2] B29J *5/00*

U.S. Cl. 425—80 **1 Claim**



1. Apparatus system for the manufacture of fiberboard products having a final thickness of no more than about 0.16 inches on a continuous basis comprising, in combination:

a. felting means for continuously forming a binder-impregnated wood fiber mat;

b. conditioning means for adjusting the temperature of the mat to about the glass transition temperature of the ligneous hemicellulosic matrix material of wood at a moisture content of the mat from about 6% to 12%;

c. prepress means for pressing the mat as conditioned to reduce permanently the thickness of the mat and substantially eliminate entrained air therefrom;

d. hot press means for reducing further the thickness of the mat to the final thickness desired and partially curing the binder;

e. heated tunnel means within which complete cure of the binder is effected; and

f. conveying means for conveying the mat as it is continuously formed away from said felting means whereby said mat from its leading end is sequentially treated thereby to form said fiberboard products.

4,056,343

APPARATUS FOR CONTINUOUSLY PRODUCING RAISED MARKS ON PLASTIC CABLE JACKETS

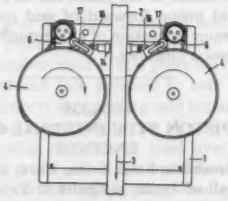
Hans Kaiser, Ditzingen; Ernst Konnerth, and Gert Kramer, both of Stuttgart, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,299

Claims priority, application Germany, Mar. 1, 1975, 2509027

Int. Cl.[2] B29C *25/00*

U.S. Cl. 425—112 **5 Claims**



1. Improvements of an apparatus in tandem with an extruder comprising apparatus for continuously producing raised marks on plastic cable jackets disposed in the immediate vicinity of said extruder producing the cable jacket having in combination:

at least one rotatable drum disposed on one side of the cable emerging from the extruder with its circumferential surface coming into contact with the cable surface, said drum having marks or depressions on its circumferential surface corresponding to the outlines of the marks,

an automatic advancing counting mechanism associated with said drum for forming length markings on said drum's circumferential surface with a powder container associated with the circumferential surface of said drum and having an outlet bearing on the surface of the drum in the area of the marks characterized by the combination of:

means operatively associated with said at least one drum for driving said at least one of said drums including a stepper motor controlled synchronously with the cable take-off speed;

means mounting said at least one drum so as to be vertically adjustable on swivel arms, said swivel arms being mounted on a movable carriage having means for locking the elements associated with and allowing said carriage to be movable;

said carriage including a supply of plastic powder and pipe means interconnecting said powder supply to said container; and

said container being pivotably mounted and positioned in the area of the marks on the surface of said drum and having biasing means operatively associated with said container for causing said outlet to bear against said drum's surface with a preselected pressure.

4,056,344

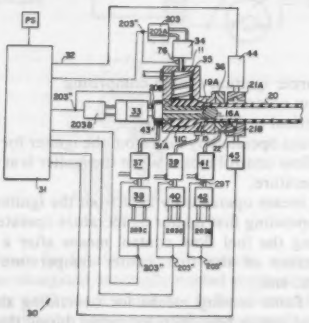
APPARATUS FOR PRODUCING COMPOSITE EXTRUSIONS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 68,724, Sept. 1, 1970, Pat. No. 3,708,253, which is a continuation-in-part of Ser. No. 736,081, June 11, 1968, Pat. No. 3,526,020, which is a division of Ser. No. 142,405, Oct. 2, 1961, Pat. No. 3,422,648. This application Dec. 29, 1972, Ser. No. 319,194

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—132 **9 Claims**



1. An apparatus for forming an integrally molded article of at least two different thermoplastic materials comprising:

a die to define a predetermined shaped article,

a first variably controllable means operatively associated with said die for introducing a first melt material into said die,

a second variably controllable means operatively associated with said die for introducing a second melt material into said die whereby said first and second materials occupy selected portions of said shaped article defined by said die to form a composite molded article of said materials,

and a control means operatively associated with first and second variably control means for variably controlling said first and second variably controllable means for predeterminately activating said first and second means so as to variably control the introduction of said first and second melt materials into said die during a forming operation whereby the formed thermoplastic article will embody the attributes and characteristics of the respective first and second materials.

4,056,345

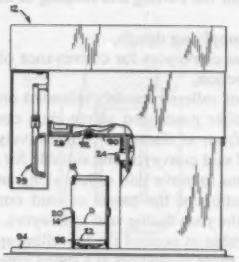
DOUGH FORMING APPARATUS

Mounir A. Shatila; William H. VonDer Lieth, both of Blackfoot; John L. Veeneman, and Marion E. Thomas, both of Idaho Falls, all of Idaho, assignors to AMPCO Foods Inc., San Francisco, Calif.

Division of Ser. No. 507,602, Sept. 19, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,530

Int. Cl.[2] A21C *11/18, 3/04*

U.S. Cl. 425—186 **13 Claims**



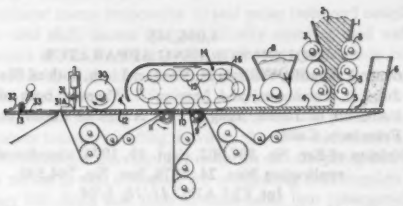
1. In apparatus for reconstituting dehydrated potato agglomerates by adding water to the agglomerates to form dough and for shaping the dough into shaped potato pieces, said apparatus being of the type having an impervious wall defining an elongate chamber of uniform cross-sectional shape, means mounting said chamber on a generally horizontal axis, said chamber being open ended to define a discharge opening at one end thereof and a rear opening opposite the discharge opening, a piston movable in said chamber, means extending through said rear opening and operative to move said piston toward and away from said discharge opening to effect discharge of dough through said discharge opening, dough shaping means supported adjacent said discharge opening shaping dough discharged from said chamber by movement of said piston toward said discharge opening, a first latch element on said piston moving means and a second latch element on said piston that is removably interengageable with said first latch element to effect removable attachment of said piston to said piston moving means, said chamber wall having an upward open side opening adjacent said rear opening, and means operative to introduce into said chamber through said side opening preselected amounts of potato agglomerates and water, the improvement for forming an impervious dough barrier spanning said discharge opening comprising supporting means interengageable with said second latch element supporting said piston in a substantially horizontal plane, means mounting said supporting means in vertical alignment below said introducing means, and means positioning said chamber upon the piston when the piston is engaged on said supporting means in substantially vertical disposition, said positioning means being disposed to position said chamber so that said piston is within said chamber adjacent said discharge opening thereby to form an impervious receptacle thereabove for receiving agglomerates and water from said introducing means.

4,056,346

APPARATUS FOR PROCESSING DOUGH

Torahiko Hayashi, Post Office Box 50, 2-3 Nozawa, Utsunomiya 320, Japan

Filed Feb. 25, 1975, Ser. No. 552,760
Claims priority, application Japan, Feb. 25, 1974, 49-22041
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.
Int. Cl.[2] A21C *3/02*
U.S. Cl. 425—373 **3 Claims**



1. Apparatus for the cutting and shaping of dough, comprising

a. means for supplying dough,

b. at least three conveyors for conveyance of said dough in a given direction,

c. a plurality of rollers rotatably mounted on shafts with at least one roller positioned above each conveyor spaced apart therefrom at distances progressively closer in the direction of said conveyor and suitable for stretching said dough, means to move said rollers along an elliptical path in the direction of the travel of said conveyors at the portion of the path facing said conveyors,

d. means operable to control the travelling speed of each of said at least three conveyors at a speed greater than that of the next upstream conveyor and operable to control the speed of the progress of said rollers at a speed greater than that of any of said conveyors,

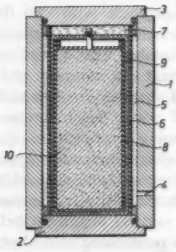
e. whereby the dough is stretched by the coaction of said rollers and said conveyors to a thickness of between 1 and 4 mm.

4,056,347

ISOSTATIC COMPACTOR OF PULVERULENT MATERIALS AND THE LIKE

Sten Trolle, Ystad, Sweden, assignor to AB Carbox, Ystad, Sweden

Filed Dec. 27, 1976, Ser. No. 754,420
Int. Cl.[2] B30B *5/02, 11/00*
U.S. Cl. 425—405 H **6 Claims**



1. Apparatus for isostatic compaction of a pulverulent material, comprising:

a pressure vessel **(1,2,3)** containing first and second liquids **(5,7)** separated from each other;

container means **(9)** housing the pulverulent material during the compaction thereof and being insertable in said pressure vessel;

deformable supporting means **(8)** surrounding and supporting said container means **(9)** during its insertion into and removal out from said pressure vessel, said deformable supporting means **(8)** being in contact with said first liquid **(5)** surrounding said deformable supporting means **(8)** when it is in said pressure vessel; and

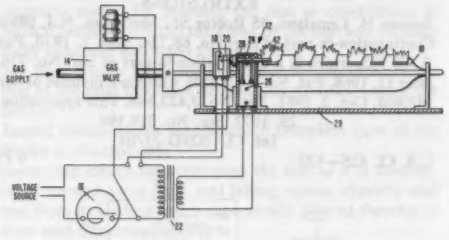
flexible partition means **(6)** in said pressure vessel for separating said first and second liquids **(5,7)** from each other and providing pressure equalization between said liquids, said flexible partition **(6)** means contacting said deformable supporting means **(8)** upon pressurization of said liquids for compacting the pulverulent material in said container and deforming said supporting means **(8)** towards said container means **(9)** when contacted by said flexible partition means **(6).**

4,056,348

GLOW COIL IGNITION SYSTEM WITH FLAME SENSING

Denis G. Wolfe, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 23, 1976, Ser. No. 651,873
Int. Cl.[2] F23N *5/02*
U.S. Cl. 431—66 **9 Claims**



1. A burner ignition system comprising

fuel flow control means,

an electrical resistance igniter,

first means operated by heat from the igniter for opening the fuel flow control means when the igniter is at fuel ignition temperature,

second means operated by heat from the igniter overriding the operating first igniter temperature operated means for closing the fuel flow control means after a duration of operation of the first igniter temperature responsive means, and

burner flame sensing means for overriding the operating second igniter heat operated means during the presence of a flame.

4,056,349

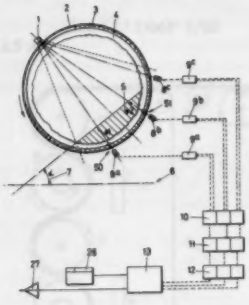
DEVICE FOR MEASURING SLOPE PARAMETERS FOR A MATERIAL CONTAINED INSIDE A CYLINDER ROTATED ABOUT THE AXIS THEREOF

Jean Parisis, Haccourt; Roger Rossion, Richelle, and Jacques Depoitier, Wanfercee Baulet, all of Belgium, assignors to Cimenteries C.B.R. Cementbedrijven, Watermael-Boisfort, Belgium

Filed June 30, 1975, Ser. No. 592,053
Claims priority, application Belgium, July 1, 1974, 0146110
Int. Cl.[2] F27B *9/40*
U.S. Cl. 432—36 **11 Claims**

1. A device for measuring slope parameters for a loose material contained inside a hollow cylindrical wall which rotated about its axis so that when viewed in transverse cross section the material forms a slope segment in engagement with the inner surface of said wall, said apparatus comprising a radioac-

tive source generating a stream of penetrating radiation; means supporting said radiation generating means adjacent the exterior of said cylindrical wall at a location opposite the slope segment in a position in which the stream of radiation passes through said wall and through at least two circumferentially



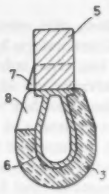
spaced-apart portions of the slope segment of material; separate means for sensing the radiation passing through each of the two portions and generating signals in accordance with the sensed radiation; and means for analyzing the signals from said sensing and signal generating means.

4,056,350

SUPPORT RAIL ARRANGEMENT

Rüdiger Knaak, Neuss, Germany, assignor to Koppers-Wistra-Ofenbau GmbH, Dusseldorf, Germany

Filed Feb. 11, 1976, Ser. No. 657,107
Claims priority, application Germany, Feb. 26, 1975, 2508206
Int. Cl.[2] F27D *3/02*
U.S. Cl. 432—234 **8 Claims**



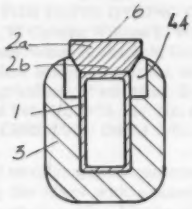
1. In a furnace for heat treating workpieces, a combination comprising an elongated, internally cooled supporting member for supporting workpieces which are to be advanced through and heat treated in the furnace; a workpiece-engaging member mounted on said supporting member and having an upper portion adapted to support a workpiece from below; insulating means partially surrounding said supporting member for insulating the latter from heat; and protecting means provided on at least one of said members for protecting said insulating means from damage by a workpiece in the event that a workpiece slides off said upper portion of said workpiece-engaging member, said protecting means comprising an element having an outer portion which extends outwardly of said supporting member in direction transversely of the elongation thereof, said insulating means having at least one side portion subject to damage by a workpiece in the event that the latter slides off said workpiece-engaging member, and wherein said outer portion overlies said one side portion of said insulating means.

4,056,351

WORKPIECE-ENGAGING ELEMENT FOR FURNACES

Rüdiger Knaak, Neuss, Germany, assignor to Koppers-Wistra-Ofenbau GmbH, Dusseldorf, Germany

Filed Feb. 3, 1976, Ser. No. 654,917
Claims priority, application Germany, Feb. 7, 1975, 2505179
Int. Cl.[2] F27B *9/14*
U.S. Cl. 432—234 **12 Claims**



1. In a furnace for heat treating workpieces, a combination comprising an elongated internally-cooled supporting member for supporting workpieces which are to be advanced through the furnace; and a plurality of workpiece-engaging elements of one-piece constructions each having a lower portion mounted on said supporting member and an upper portion having an upwardly-directed planar surface which is adapted to support the workpieces from below, said lower portion having a smaller cross-section than said upper portion, wherein said supporting member has a side facing said lower portions of said elements, and wherein each of said lower portions has a mounting face in surface engagement with said side of said supporting member wherein said lower portion has a pair of spaced sidewalls which diverge away from each other in direction from said lower portion towards said upwardly-directed planar surface of said upper portion.

4,056,352

DRY TRANSFER OF ORGANIC COMPOUNDS TO WEBS

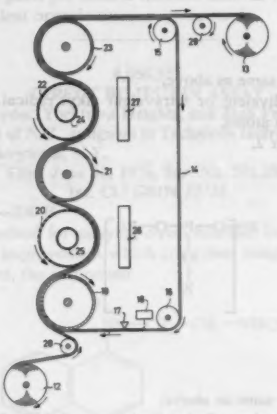
Fritz Mayer, Haltingen, Germany, assignor to Ciba-Geigy AG, Haltingen, Germany

Continuation of Ser. No. 497,599, Aug. 15, 1974, abandoned. This application July 13, 1976, Ser. No. 704,898

Claims priority, application Switzerland, Aug. 22, 1973, 12062/73

Int. Cl.[2] D06P *1/00*

U.S. Cl. 8—2.5 A 16 Claims



1. A process for the continuous, dry transfer of an organic compound to a web of air-permeable organic textile material, comprising, the steps of

1. applying to a carrier a preparation which contains at least one organic compound that is converted into the vapour state at atmospheric pressure and at a temperature above 80° C,
2. bringing said carrier into contact with a side of the air-permeable web of organic textile material to be treated, in such a manner that web and carrier advance together synchronously, the one superimposed on the other,
3. subjecting carrier and web under atmospheric pressure to a heat treatment in a heating zone of at least 80° C sufficient to raise the temperature of the web to the temperature at which the organic compound is converted to the vapour state, said heat treatment being applied from the carrier side,
4. advancing said carrier and web from the heating zone and subsequently into a suction zone and subjecting said carrier and web to a suction treatment applied from the web side until the organic compound has been transferred from the carrier to the textile web, and
5. separating the treated web from the carrier.

4,056,353

TEXTILE FINISHING

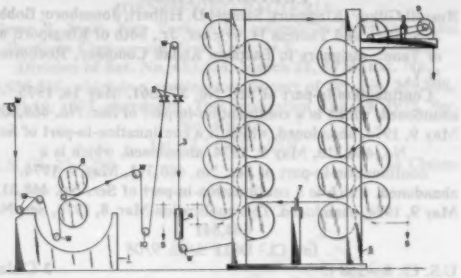
Alfred H. Bent, 2400 Kingman Drive; George J. Booth, 1102 Piper Road, Graylyn Crest, both of Wilmington, Del. 19803, and Anthony Perregrino, 207 Taylor Road, Wilmington, Del. 19804

Filed Mar. 26, 1976, Ser. No. 670,941

Int. Cl.[2] D06P *7/00*

U.S. Cl. 8—14 9 Claims

1. An apparatus for migration-dyeing of fabrics which comprises a means for applying dye on an open sheet of fabric so that the fabric can attain a pick-up of from about 55 weight percent up to about 75 weight percent; a means for converting the sheet into a tight fabric rope wherein an integral part of said means is a tube-eye; placing tension on the tight fabric rope; a contact drying means for the tight fabric rope to pass over so that the rope intimately contacts the hot surface of the dryer under such tension that the tight rope fabric is flattened



against the drying surface, forcing all layers into intimate contact.

4,056,354

PROCESS FOR RAPID DYEING OF TEXTILES

Allen G. Pittman, El Cerrito; William L. Wasley, Pacific Grove, both of Calif., and Nelson F. Getchell, Great Falls, Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 10, 1976, Ser. No. 657,011

Int. Cl.[2] C09B *67/00*; D06M *3/02, 5/14, 1/00*

U.S. Cl. 8—54 17 Claims

1. A process of modifying proteinaceous fibers, which comprises contacting the fibers with a solution of a dyeing or finishing agent in ethylene glycol in the absence of water and in the presence of 0.6% of an acid, based on the weight of acid to the volume of ethylene glycol, at a temperature of about from 110° to 165° C.

4,056,355

DETERGENT FORMULATIONS AND THEIR USE

Jack H. Kolaian, Wappingers Falls; Frederic C. McCoy, Beacon, and John A. Patterson, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,758

Int. Cl.[2] C11D *3/08*

U.S. Cl. 8—137 4 Claims

1. A process for removing the soil from soiled cotton fabric in an aqueous environment consisting essentially of:

A. contacting the soiled cotton fabric to be cleaned with a free-flowing detergent formulation of:
   a. from about 5 to 45 parts by weight of at least one fatty alcohol surfactant containing 6 to 18 carbon atoms, said alcohol or alcohols being the sole surfactant present,
   b. from about 5 to 95 parts by weight of builder,
   c. from about 1 to 10 parts by weight of detergent additives, and
   d. from about 5 to 45 parts by weight of finely divided, water-insoluble, chemically non-reactive, inorganic absorbent passing through a 325 mesh sieve and having surface area of at least 30 M^2/g, said parts by weight of the free-flowing detergent formulation of (a), (b), (c) and (d) being based upon the final weight of the aqueous laundering environment;

B. continuing said contact of the soiled cotton with the aqueous laundering environment until substantially all of the soil has been removed from the soiled cotton.

4,056,356

POLYESTER FIBER

Russell Gilkey, Kingsport; Samuel D. Hilbert, Jonesboro; Bobby J. Sublett, and Thomas H. Wicker, Jr., both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 577,361, May 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 468,309, May 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,310, May 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,311, May 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,312, May 9, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,841

Int. Cl.[2] **D01F** *6/62, 9/08*

U.S. Cl. 8—168 C **3 Claims**

1. A textile fiber comprised of

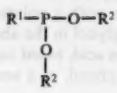
A. a polyetherester of

1. terephthalic acid, and
2. a diol component comprised of
   a. 1,4-cyclohexanedimethanol, and
   b. from 3 to 12 weight percent, based on the weight of the polyetherester, of poly(oxyethylene)glycol having a molecular weight in the range of 300–800,

B. based on the weight of the polyetherester, from 0–150 weight parts per million of manganous ion,

C. based on the weight of the polyetherester, from 20–500 weight parts per million phosphorus derived from

1. phosphorus acid,
2. phosphoric acid,
3. pyrophosphoric acid,
4. polyphosphoric acid, or a compound corresponding to the formula

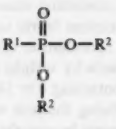


(5)

where

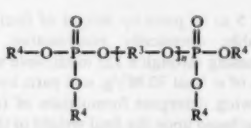
R^1 is —H, a monovalent alkyl radical having 1–18 carbon atoms, a monovalent aryl or substituted aryl radical having 6–15 carbon atoms, or -O-R where R is —H, a monovalent alkyl radical having 1–18 carbon atoms or a monovalent aryl or substituted aryl radical having 6–15 carbon atoms,

R^2 is —H, monovalent alkyl radical having 1–18 carbon atoms, or a monovalent aryl or substituted aryl radical having 6–15 carbon atoms, provided that when R^2 is alkyl, at least one of R^2 has a chain of at least two unsubstituted methylene groups attached to the oxygen atom attached to phosphorus,



(6)

where R^1 and R^2 are the same as above,



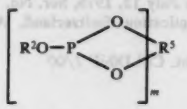
(7)

where

R^4 is —H, a monovalent alkyl radical having 1–18 carbon atoms, or a monovalent aryl or substituted aryl radical having 6–15 carbon atoms,

n = 1–6,

$R^3 = (CH_2)_x$ where x = 2–6,



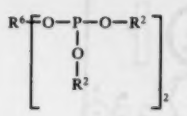
(8)

where

R^2 is the same as above,

R^5 is a divalent or tetravalent alkyl radical having 2–5 carbon atoms,

m = 1 or 2,

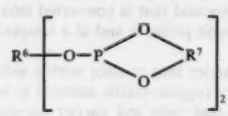


(9)

where

R^2 is the same as above,

R^6 is a divalent alkyl radical having 2–12 carbon atoms or a divalent aryl or substituted aryl radical having 6–15 carbon atoms,



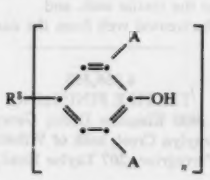
(10)

where

R^6 is the same as above,

R^7 is a divalent alkyl radical having 2–5 carbon atoms,

D. based on the weight of the polyetherester, from 1000 to 5000 weight parts per million of a stabilizer effective to reduce oxidative degradation of the polyetherester corresponding to the structure



where

n is from 1 to 4,

R^8 is a radical selected from the group consisting of

1. neopentanetetrayltetrakis,
2. phosphinylidynetrioxy,
3. 2,4,6-trimethyl-1,3,5-benzenetriyltrimethylene,
4. alkylene having 1 to 5 carbon atoms,
5. alkyl having 1 to 12 carbon atoms,

6. 2,4,6-trioxo-1,2,3,4,5,6-hexahydro-S-triazine1,3,5-triyl)tris(3-oxotrimethylene),
7. [3-octadecyloxy)-3-oxopropyl],

A is a monovalent radical selected from the group consisting of

1. tertiary alkyl having 4 to 8 carbon atoms,
2. alkyl having 8 to 22 carbon atoms, and
3. secondary alkyl having 12 to 24 carbon atoms,

E. based on the weight of the polyetherester, from 25–200 weight parts per million titanium derived from a soluble tetravalent organic titanium compound.

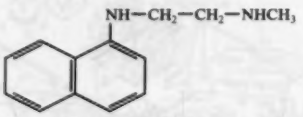
4,056,357

DIRECT BILIRUBIN ASSAY

Lloyd R. Snyder, Yorktown Heights, and Jana Furda, Pleasantville, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed June 30, 1976, Ser. No. 701,186
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **2 Claims**

1. In a method for assaying direct bilirubin in a multi-assay system, the improvement which comprises using, as a calibration standard, the compound



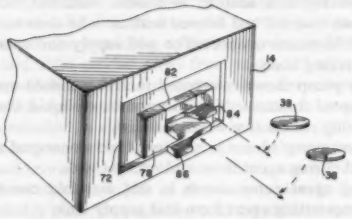
or addition salts thereof.

4,056,358

APPARATUS FOR DERIVING BLOOD OXYGEN ASSOCIATION CURVE INFORMATION

Paolo Priarone, West Hyattsville, and Eugene K. Achter, Gaithersburg, both of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 22, 1976, Ser. No. 743,570
Int. Cl.² G01N *33/16, 21/24*
U.S. Cl. 23—253 R **6 Claims**



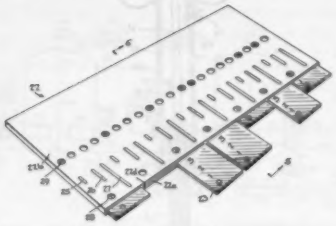
1. An apparatus for incubating and analyzing blood samples, said apparatus comprising, in combination, means defining a sample treating chamber, means for controlling the atmosphere within said chamber, a slide assembly including a slide holder and first and second slide units each including a portion thereof adapted to receive and hold a blood sample to be analyzed, said slide units being mounted for movement with respect to said slide holder along a predetermined path between a loading and unloading position, an incubating position, and an analysis position, and cooperating means on said slide units and said slide holder for guiding said slide units along said path during movement thereof into and out of said chamber and for sensibly indicating when each of said slides is located at any one of said positions.

4,056,359

PROFILE RECOGNITION APPARATUS FOR IDENTIFYING BACTERIA

Pierre R. Janin, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 453,434, March 21, 1974, Pat. No. 3,936,356, which is a continuation-in-part of Ser. No. 349,698, April 10, 1973, abandoned. This application Aug. 14, 1975, Ser. No. 604,875
Int. Cl.² C12K *1/04*
U.S. Cl. 23—259 **14 Claims**



1. Apparatus for the identification of an unknown substance, a specimen of the substance having been prepared to be analyzed, portions of the prepared specimen being caused to undergo a plurality of different tests, and a determination made as to whether the specimen has reacted with each of the tests, the determinations being arranged into at least one group which includes a plurality of determinations, the identification being accomplished by transforming the determination into a score value, the score value for each determination being different dependent upon whether the specimen has or has not reacted, the score value weighted differently among determinations in a group for one of the conditions of whether the specimen has or has not reacted and combining the score values of each group to form an intermediate value which is a function of all of the score values of the group, the apparatus comprising:

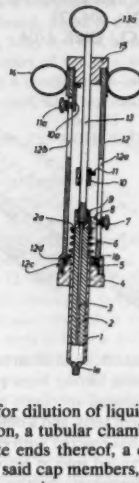
a. structure forming a supporting frame;
b. at least one strip slidably mounted for movement along the length of the supporting frame, each strip corresponding to a different group of determinations;
c. means for shifting said strip in increments in the direction of the length of said strip, the magnitude of each increment being a function of the score value of a different determination in a group corresponding to said strip and thereby transforming each determination into a score value, the sequential movements of said strip providing a total movement representative of the combining of the score values of the group and thereby the intermediate value thereof;
   A. said means for moving said strip including a cover portion having a plurality of elongated slots for each group, the number of slots for each group corresponding to the number of determinations for the group, each slot having its length extending substantially parallel to the length of the slide and spaced apart from one another and a function of the maximum weighted score value corresponding to each determination;
   B. said strip having elements disposed in rows thereon, each row extending in alignment with a different slot of said slots associated with said strip, the elements of each row being spaced apart from one another at intervals corresponding to a function of the movement of said strip to a score value in the range between the minimum and maximum score values for the determination; and
d. indicia associated with said strip for presenting the intermediate value in response to the total movement of said strip and including indicia disposed along a line parallel to the length of said strip.

4,056,360

APPARATUS FOR DILUTION OF LIQUID SPECIMENS

Gerhard M. Risch, Schaan, Liechtenstein

Filed Feb. 17, 1976, Ser. No. 658,748
Claims priority, application Germany, Feb. 18, 1975, 2506844
Int. Cl.[2] B01L *3/02*; G01N *1/14, 1/18*
U.S. Cl. 23—259 6 Claims



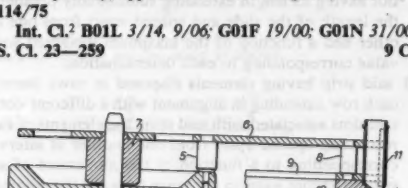
1. An apparatus for dilution of liquid specimens which comprises in combination, a tubular chamber having cap members disposed at opposite ends thereof, a cylindrical member projecting from one of said cap members, said cylindrical member having a restricted opening at one end for receiving fluids, a spring biased piston slidably disposed within the cylindrical member, means for limiting the movement of said spring biased piston out of the cylindrical member, a second piston axially disposed through a bore within the spring biased piston, said second piston having substantially the same length as the spring biased piston, a piston rod projecting through the opposite cap member and engaging the second piston by means of a head portion, said piston rod having externally disposed means for movement of the spring biased piston and the second piston respectively whereby controlled amounts of a liquid specimen may be introduced into the cylindrical member upon retraction of the spring biased piston, and further controlled amounts of a liquid specimen may be introduced into the cylindrical member upon retraction of the second piston.

4,056,361

VIAL OR OTHER CONTAINER, AND CARRIER THEREFOR

Ann Margaret Peters; Geoffrey Stuart Greaves; Ian Robert Clark; Roger Leonard Holder, and Roger Abraham Bunce, all of Birmingham, England, assignors to The Secretary of State for Social Services in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed June 11, 1976, Ser. No. 694,971
Claims priority, application United Kingdom, June 11, 1975, 25114/75
Int. Cl.[2] B01L *3/14, 9/06*; G01F *19/00*; G01N *31/00*
U.S. Cl. 23—259 9 Claims



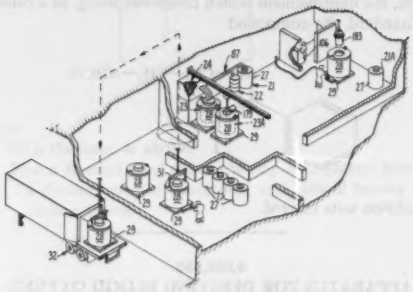
1. A combination comprising a carrier and self-locating container, said carrier including at least one container receiving pocket, said pocket having an inlet with a cross-section to receive a container in any angular displacement about the pocket axis and an internal, plane cam surface located opposite to said opening, said cam surface being inclined at an acute angle to the pocket axis for angular aligning during positioning within said pocket a container having a complementary cam surface, and a container having a cam surface complementary to the cam surface of said pocket, whereby said container is aligned in a predetermined angular displacement by and with respect to the cam surface of the pocket during positioning within said carrier pocket.

4,056,362

SYSTEM FOR DISPOSING OF RADIOACTIVE WASTE

Kenneth A. Gablin, Burton, and Larry J. Hansen, Tacoma, both of Wash., assignors to Nuclear Engineering Co., Inc., Louisville, Ky.

Division of Ser. No. 220,214, Jan. 24, 1972, abandoned. This application June 27, 1974, Ser. No. 483,785
Int. Cl.[2] B01J *1/00*; G21F *9/00*
U.S. Cl. 23—260 36 Claims



1. A system for solidifying a slurry of radioactive waste material into a solid plastic matrix of cured polymer having radioactive waste particles distributed throughout, comprising

a supply tank adapted to contain a polymerizable setting agent in liquid form,

a catalyst tank adapted to contain a curing agent for said setting agent in liquid form,

a receiving tank adapted to contain solidified radioactive waste material and formed with an inlet thereto,

manifold means connected to said supply and catalyst and receiving tanks,

slurry pump means interposed in said manifold means and adapted for connection to a source of liquid slurry containing radioactive waste material,

catalyst pump means in said manifold connected to pump said curing agent from said catalyst tank,

setting agent pump means in said manifold connected to pump setting agent from said supply tank,

said pump means being formed to pump proportioned amounts of said setting agent and said curing agent and said radioactive slurry into said receiving tank for regulating the specific activity radiation characteristics per unit of volume of the materials in said tank,

radioactivity control means connected to said pump means and responsive to specific activity levels in said system to regulate pump speed thereby to maintain the specific radioactivity level of the material in said receiving tank at no more than a predetermined Low Specific Activity rating,

a first mixing means connected to said pumping means and formed for intermixing said setting agent and said radioactive slurry before delivery to said receiving tank,

and a second mixing means positioned at the inlet to said receiving tank and formed for intermixing said curing

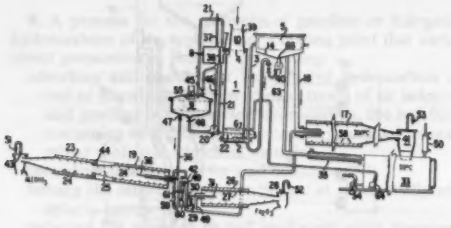
agent with the intermixed setting agent and slurry from said first mixing means as they enter said receiving tank.

4,056,363

APPARATUS FOR THE FABRICATION OF PURE ALUMINA FROM AL_2O_3 AND SILICA CONTAINING RAW MATERIALS BY LEACHING WITH HYDROCHLORIC ACID

Georg Messner, Latemar-Strasse 7, 8000 Munich 90, Germany

Division of Ser. No. 453,265, March 21, 1974, Pat. No. 3,959,438. This application Feb. 27, 1976, Ser. No. 661,982
Int. Cl.² B01D *9/02, 11/02;* C01F *7/22, 7/04*
U.S. Cl. 23—270 R **13 Claims**



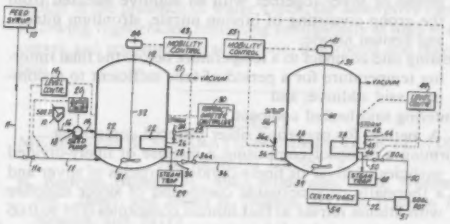
1. Apparatus for the production of pure alumina from silicate containing raw materials comprising means for feeding said raw material into an acid resistant leaching tower from the top portion thereof; means for feeding a leaching liquor containing hydrochloric acid into the bottom portion of said leaching tower, so as to continuously flow said leaching liquor upward countercurrently through said raw material flowing downward in order to leach out the alumina as a solution enriched in aluminum chloride, leaving a raw material solid residue; means for withdrawing said solution enriched in aluminum chloride from the top portion of said tower; means for withdrawing said raw material solid residue from the bottom portion of said tower; means for providing a flowing carrier liquid for conveying said solid residue away from said leaching zone and into a separator means and separator means for removing said solid residue from said carrier liquid; means to convey said solution enriched in aluminum chloride at about 120° C. from said leaching tower into and through a balancing container means and into a backwashable sand filter; means for conveying said solution enriched in aluminum chloride from said backwashable sand filter into the cold crystallizer section of a crystallizer-thermal-decomposer combination, comprising a rotating, inclined tube made of acid and heat resistant material and containing a mother liquor, causing said aluminum chloride to precipitate in said crystallizer as $AlCl_3 . 6 H_2O$ crystals; screw conveyor flights within said tube for transporting said precipitated crystals through an intermediate washing means into a hot thermal decomposer to convert said $AlCl_3 . 6 H_2O$ crystals into $al(OH)_3$ and into vapors of HCl and water; means for conveying said vapors countercurrent to said crystals from said thermal decomposer through said intermediate washing means and into said crystallizer; means to recover said $Al(OH)_3$; means providing a fluid-tight feeding shaft inside the upper end portion of said leaching tower; and means for adding amounts of new raw material into said feeding shaft to a sufficient height to absorb rising HCl vapors and to prevent escape of said vapors into the atmosphere.

4,056,364

TWO STAGE CONTINUOUS CRYSTALLIZATION APPARATUS WITH CONTROLS

Morris Dmitrovsky, Roslyn Heights, N.Y., and Antoine H. Kokke, Rosemont, Pa., assignors to Amstar Corporation, New York, N.Y.

Division of Ser. No. 501,862, Aug. 30, 1974, Pat. No. 3,981,739. This application Jan. 19, 1976, Ser. No. 650,300
Int. Cl.² B01D *9/02*
U.S. Cl. 23—273 R **9 Claims**



1. An apparatus for the continuous crystallization of a crystallizable solute from a feed solution thereof comprising in combination a first stage crystallization zone, a second stage crystallization zone, said first stage crystallization zone and said second stage crystallization zone each being provided with fluid agitating means, first feed solution conduit means for supplying said feed solution to said first stage crystallization zone, first transfer conduit means for the transfer of fluid from said first stage crystallization zone to said second stage crystallization zone, first flow control means associated with said first transfer conduit means for controlling the flow of fluid therein from said first crystallization zone to said second crystallization zone, said first flow control means being controlled by means for measuring the total solute concentration of the fluid contents undergoing processing within said second stage crystallization zone, means for introduction of solute seed crystals to said first crystallization zone, second flow control means associated with said means for introduction of said solute seed crystals for controlling the introduction of solute seed crystals to said first crystallization zone, said second flow control means being responsive to the feed solution introduced to said first crystallization zone, said second flow control means comprising a ratio controller controlling the proportion of solute seed crystals introduced into said first stage crystallization zone relative to the feed solution supplied to said first crystallization zone means for heating the fluid contents of said first stage and said second stage crystallization zones, said means for heating being provided within said first stage and said second stage crystallization zones, respectively, said means for heating of the contents of said first stage crystallization zone being controlled by means measuring the concentration of dissolved solids in the fluid within said first stage crystallization zone, said means for heating of the contents of said second stage crystallization being controlled by means measuring the total solute concentration of the fluid contents within said second stage crystallization zone, third transfer conduit means for the withdrawal of fluid from said second stage crystallization zone, third flow control means associated with said third transfer conduit means for control of fluid withdrawn from said second stage crystallization zone, said third flow control means being responsive to the fluid level within the second stage crystallization zone means for producing a reduced pressure within said first stage and within said second stage crystallization zones, second feed solution conduit means for supplying additional feed solution to said second stage crystallization zone, fourth flow control means responsive to the total solute concentration of the fluid contents undergoing processing within said second stage crystallization zone for controlling the flow of feed solution to said second crystallization zone.

4,056,365

SILVER ELECTRICAL CONTACT MATERIALS AND METHOD OF MAKING

Richard C. Bevington, Delmont, and David J. Snee, Murrysville, both of Pa., assignors to Gibson Electric, Inc., Delmont, Pa.

Filed Nov. 10, 1975, Ser. No. 630,349
Int. Cl.[2] B22F *3/00*
U.S. Cl. 428—565 **20 Claims**

1. A method for preparing silver material comprising

forming a compact of a mixture of particles of silver or particles of silver and a thermally decomposable compound of silver together with an additive selected from the group consisting of lithium nitrate, strontium nitrate, and cesium nitrate;

heating said compact to a temperature below the final sintering temperature for a period of time sufficient to decompose said additive; and

sintering said heated compact.

7. A method for preparing silver material comprising

forming a compact comprising a mixture of finely-divided particles of silver or finely-divided particles of silver and a thermally decomposable compound of silver together with lithium nitrate so that lithium constitutes 0.01 to 0.05 percent by weight of the mixture;

heating said compact at about 600° to 700° C for about20 minutes to 1 hour to decompose said lithium nitrate and to drive off entrapped gases and volatile impurities; and

heating said compact at about 850° to 950° C for about ½ to 2½ hours to form a sintered silver compact.

4,056,366

ZINC-ALUMINUM ALLOY COATING AND METHOD OF HOT-DIP COATING

Harvie Ho Lee, Glenwood, Ill.; David W. Gomersall, Valparaiso, and Harry P. Leckie, Schererville, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Dec. 24, 1975, Ser. No. 644,109
Int. Cl.[2] C23C *1/02*
U.S. Cl. 29—653 **14 Claims**

1. A ferrous metal sheet having on a surface thereof a zinc-aluminum alloy continuous hot-dip coating consisting essentially of between about 0.2 wt. % and about 17 wt. % aluminum, between about 0.02 wt. % and about 0.15 wt. % antimony and a maximum of about 0.02 wt. % lead with the balance essentially zinc, and said alloy coating characterized by having a smooth bright ripple-free surface which is resistant to intergranular corrosion and blistering along grain boundaries when exposed for prolonged periods to a high humidity atmosphere, and said coating being formable without having the coating separate from the sheet both before and after prolonged exposure to said high humidity atmosphere.

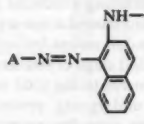
4,056,367

LIQUID MONOAZO-NAPHTHALENE DYESTUFFS, AND THEIR USE

Aime Joseph Arsac, Condrieu, and Pierre Frank, Saint Clair du Rhone, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed June 10, 1975, Ser. No. 585,546
Claims priority, application France, June 28, 1974, 74.22597
Int. Cl.[2] C10L *1/10*; C09B *29/06*; C07C *107/04, 107/08*
U.S. Cl. 44—59 **8 Claims**

1. Liquid dyestuff of the formula:



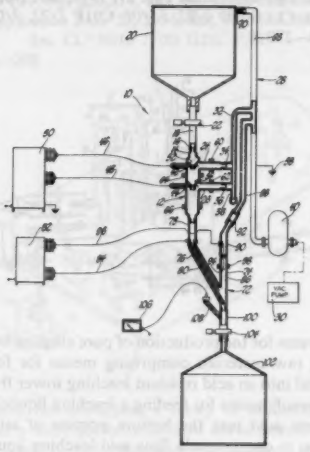
in which A represents phenyl or naphthyl, which is unsubstituted or substituted by at least one alkyl or alkoxy group containing 1 to 2 carbon atoms, y represents 0 or 1, x and z each represent a whole number such that the sum $x + y + z$ is a whole number from 5 to 17.

4,056,368

METHOD AND APPARATUS FOR DEGASSING GAS CONTAMINATED PARTICULATE MATERIAL

Walter J. Rozmus, Birmingham, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Feb. 4, 1976, Ser. No. 655,088
Int. Cl.[2] B03C *9/00*
U.S. Cl. 55—2 **38 Claims**



1. An apparatus for cleaning contaminated particulate material which is at least in part contaminated by gaseous contaminants, said apparatus comprising: a vacuum chamber, vacuum pump means for evacuating said vacuum chamber, means for generating an electric field within said vacuum chamber, gas outlet means connected to said vacuum pump means through which gaseous contaminants can be removed from said vacuum chamber, inlet means for introducing gas contaminated particulate material into said vacuum chamber and for subjecting said particulate material to said electric field whereby said gaseous contaminants are electrically charged to cause separation of said gaseous contaminants from said particulate material and said gaseous contaminants are excited by said electric field to facilitate removal of said gaseous contaminants from said vacuum chamber through said gas outlet means, particulate material outlet means for conducting particulate material out of said chamber and means for receiving and collecting decontaminated particulate material through said particulate material outlet means and for maintaining said particulate material in a substantially decontaminated state.

36. A method of cleaning and degassing contaminated powder metal consisting of the steps of:

a. introducing contaminated powder metal into a vacuum chamber,

b. subjecting the powder metal to an electric field to charge the powder and contaminants to separate the contaminants therefrom and

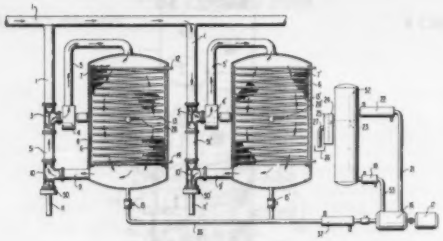
c. simultaneously evacuating the vacuum chamber by means of a suitable vacuum pump to remove separated contaminants.

4,056,369

METHOD OF AND APPARATUS FOR THE RECOVERY OF A DESIRED MATERIAL FROM A CARRIER STREAM

Henry Quackenbush, 200 Ridgewood Place, Mobile, Ala. 36608

Filed Nov. 25, 1975, Ser. No. 635,107
Int. Cl.[2] B01D *51/06*
U.S. Cl. 55—58 23 Claims



9. A process for the recovery of gasoline or halogenated hydrocarbons of the type having a boiling point that varies in direct proportion to pressure comprising:

adsorbing said gasoline or halogenated hydrocarbon on a bed of adsorbent material from a stream of air laden with said gasoline or chlorinated hydrocarbon, the bed further containing an inert, high heat capacity material intimately mixed with said adsorbent material;

providing an enclosure for said bed;

heating the interior of said enclosure at substantially atmospheric pressure;

reducing the pressure in said enclosure while maintaining the temperature in the enclosure above the vaporization temperature at the reduced pressure;

withdrawing air laden with gasoline or halogenated hydrocarbon vapor from the enclosure while maintaining the temperature in the enclosure; and

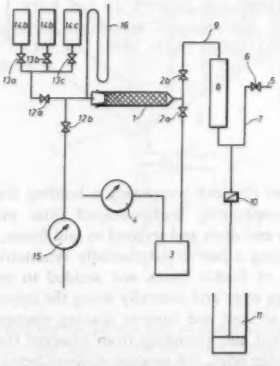
subsequently separating the gasoline or halogenated hydrocarbon from the air withdrawn from the enclosure.

4,056,370

ZEOLITE A WITH IMPROVED PROPERTIES

Gerhard Heinze, Schildgen; Manfred Mengel, Cologne, and Gerhard Reiss, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 472,387, May 22, 1974, abandoned. This application Oct. 7, 1975, Ser. No. 620,723
Claims priority, application Germany, June 7, 1973, 2329210
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—68 4 Claims



1. A process for separating a mixture of substances, comprising treating a type Na-A zeolite with a solution of a calcium salt to replace sodium and introduce x moles of calcium, the zeolite then having the formula

$$x\text{CaO} \cdot n\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot (1.85 \pm 0.5)\ \text{SiO}_2$$

in which

x has a value of at least 0.80; and

n has a value of $(1.0 \pm 0.2) - x$,

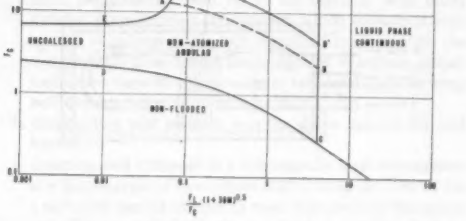
and contacting the modified zeolite with the mixture of substances selectively to adsorb on the zeolite predetermined ones of said substances, desorbing said substances, regenerating the zeolite in the presence of water vapor, the adsorptive capacity following regeneration remaining substantially as high as at the outset, and repeating the adsorption, desorption and regeneration.

4,056,371

METHOD FOR SEPARATING IMMISCIBLE FLUIDS OF DIFFERENT DENSITY

R. Bertrum Diemer, Jr., 4942 Wilderness Road, Wilmington, N.C. 28401, and James B. Dunson, Jr., 202 Winslow Road, Newark, Del. 19711

Filed Feb. 23, 1976, Ser. No. 660,181
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—90 15 Claims



1. A method for separating a flowing mixture of immiscible fluids of different density in which a higher density fluid phase is dispersed within a lower density fluid phase comprising passing the mixture through an inertial separator having an N_D value of 50 or below under conditions of non-atomizing flow such that the coordinates of the gas phase Froude coefficient and $(1 + 30M)^{0.5}$ times the ratio of the liquid phase Froude coefficient to the gas phase Froude coefficient of the fluid mixture at the separator inlet lie within the enclosed area defined by points A, B, C, D and E in FIG. 1 hereto.

4,056,372

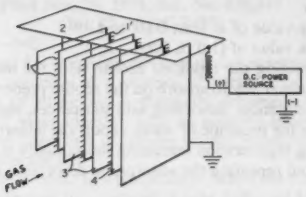
ELECTROSTATIC PRECIPITATOR

Tsutomu Hayashi, Yokohama, Japan, assignor to Nafco Giken, Ltd., Tokyo, Japan

Division of Ser. No. 406,159, Oct. 15, 1973, Pat. No. 3,958,962. This application Apr. 15, 1976, Ser. No. 677,417
Claims priority, application Japan, Dec. 30, 1972, 47-1359
Int. Cl.[2] B03C *3/24*
U.S. Cl. 55—152 5 Claims

1. A discharge electrode for use in an electrostatic precipitator comprising: a planar platelike member having a substantially straight edge along one side thereof, an elongated bracket means having an outwardly facing surface disposed longitudinally thereof, said bracket means comprising an elongated U-shaped channel member defining an open portion in said channel member opposite said outwardly facing surface, said open portion of said channel member being adapted to receive the straight edge of said platelike member, plural nee-

dle-like elements fastened at one axial end on the longitudinal surface of said bracket means in spaced-apart longitudinal alignment therealong, the other free end of said needles projecting perpendicular to said surface, and means connecting



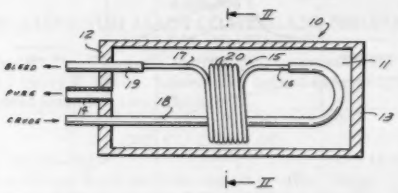
said bracket means on said edges of the platelike member in such a manner that the free ends of the needles are disposed to lie along said edge in a substantially straight line in the plane of said member.

4,056,373

HYDROGEN-PURIFICATION APPARATUS WITH PALLADIUM-ALLOY FILTER COIL

Leonard Roy Rubin, Short Hills, N.J., assignor to Resource Systems, Inc., East Hanover, N.J.

Filed May 12, 1976, Ser. No. 686,238
Int. Cl.[2] B01D *13/00*
U.S. Cl. 55—158 **2 Claims**



1. An apparatus for gas purification which comprises:
a closed chamber;
an inlet opening into said chamber;
a bleed opening from said chamber;
a helical, tubular, palladium-alloy permeation filter coil within said chamber and connected at one end to said inlet opening and at the other end to said bleed opening, said coil having a multiplicity of turns between its ends, at least some of said turns of said helical coil consisting of respective arcuate segments and respective straight segments interconnecting the arcuate segments of adjacent turns; and
an outlet opening from said chamber.

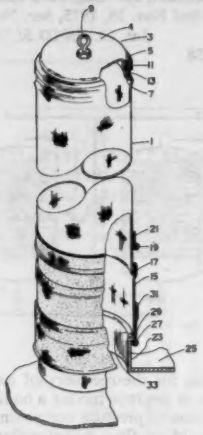
4,056,374

TUBULAR GAS FILTER

Dennis L. Hixenbaugh, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Feb. 19, 1976, Ser. No. 659,290
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—377 **9 Claims**

1. A filter bag for removing particles from a dirty gas stream comprising: a first tubular flexible gas filter member having at least one opening in one end thereof, and an opposed end having means for attaching to a bag support means; a second tubular flexible dust impervious fabric member having a cross-sectional area substantially the same as said first tubular member and having an opening in each end thereof, said second tubular member having a flexible and abrasive resistant coating thereon, one end being connected to said one end of said first tubular member, and, the other end including means for attaching to a flow inlet means; and, one motion restricting ring member attached to one of said tubular members remote from said flow inlet means disposed adjacent to the connection



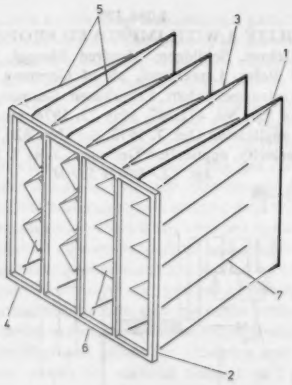
between said first tubular member and said second tubular member maintaining said connection in a substantially non-flexing position.

4,056,375

GAS FILTER ELEMENT

Wolfgang Ringel, Morlenbach; Peter Rutsch, Absteinach; Rolf Schneider, Weinheim, and Edgar Kohl, Abtsteinach, all of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Germany

Filed Sept. 3, 1976, Ser. No. 720,327
Claims priority, application Germany, Sept. 17, 1975, 2541331
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—381 **9 Claims**



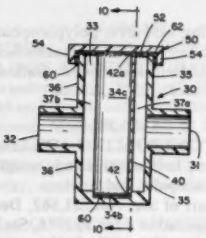
1. A gas filter element comprising a holding frame and at least one self-supporting wedge-shaped filter pocket each having its wide end open and secured to said frame, each filter pocket comprising a pair of substantially symmetrical pocket halves formed of fusible fibers and welded to one another along the wedge edge and centrally along the opposite wedge end faces and at least one laminar spacing element disposed within the pocket and extending from adjacent the open end toward the wedge edge, the spacing element being welded to the opposite inclined wedge faces, the filter pocket being rendered self-supporting by the welding of the pocket halves to

one another and the welding of the spacing element to the pocket.

4,056,376
AIR FILTER

Raymond E. Schuldenfrei, Los Angeles, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 14, 1975, Ser. No. 631,816
Int. Cl.[2] B01D *39/08*
U.S. Cl. 55—497 **4 Claims**



1. A fluid filtering device comprising:

A. a unitary container having an integral port and defining a cubic volume with at least one open surface;

B. a continuous three section trough integral within the container and adapted to receive and position three side edges of a pleated filter media element;

C. an adhesive substantially simultaneously deposited in the three sections of the trough in its gooey, uncured state;

D. a three dimensional pleated filter element having two flat planar side edges and an upper zigzag side edge and a lower zigzag side edge, three of the filter element's side edges being inserted in the goo containing trough so as to simultaneously seal three edges of the filter element to three corresponding sides of the trough, the seal becoming permanent when the goo has been allowed to cure;

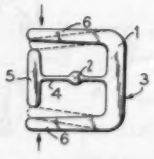
E. a cover secured to the open surface of the container, the cover having an integral port and a channel mateable with the container's trough for receiving and positioning the remaining unsealed side edge of the filter element; and

F. sealing means within the channel for providing a fluid type seal between the cover and (1) the container and (2) the remaining unsealed side edge of the filter element.

4,056,377
METHOD FOR THE PRODUCTION OF ONE-MATERIAL OPTICAL FIBERS

Franz Auracher, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 12, 1976, Ser. No. 676,351
Claims priority, application Germany, Apr. 15, 1975, 2516375
Int. Cl.[2] C03C *23/20*; C03B *11/08*
U.S. Cl. 65—4 A **9 Claims**



1. A method for the production of one-material optical fibers having at least one light conducting core component supported by a support component in a surrounding protective casing, said method comprising the steps of forming a one-piece blank having at least one light conducting core component integrally formed with a thin supporting component that extends between a pair of casing components whose side edges are spaced apart to provide an open cross section for the blank, working the blank to force the side edges of at least one of the casing components into engagement with the side edges of the other casing component to close the cross section and to form a blank with a closed cross section, heating the blank with the closed cross section to a suitable temperature for drawing, and drawing the blank with the closed cross section into said one-material optical fiber.

4,056,378
METHOD FOR PREPARATION OF VO_2 CURRENT INRUSH LIMITERS FOR INCANDESCENT LAMPS

James P. McHugh, Pittsburgh; Philip J. Nalepa, Greensburg; Robert C. Miller, Pittsburgh, all of Pa., and Chester W. Dawson, Basking Ridge, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 15, 1976, Ser. No. 723,387
Int. Cl.[2] C03B *32/00, 35/00*; H01B *1/06*
U.S. Cl. 65—18 **15 Claims**

1. The method of making a current inrush limiter for incandescent lamps substantially comprising vanadium dioxide particles maintained in a chemically stable and mechanically strong mass of predetermined dimensions by a glassy matrix binder, which method comprises:

a. mixing together finely divided vanadium sesquioxide and vanadium pentoxide wherein the molar ratio of said finely divided vanadium sesquioxide to said finely divided vanadium pentoxide is from 1:1 to 2:1 together with finely divided glass-forming constituents which include at least one of vanadium oxide and metallic vanadate, with the weight ratio of said total finely divided vanadium sesquioxide plus vanadium pentoxide to said total glass-forming constituents being from 98:2 to 70:30;

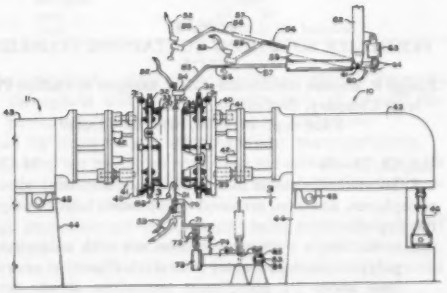
b. compacting said mixture into the shape desired for said limiter;

c. sintering said compact in a substantially inert atmosphere at a temperature of from about 800° C to about 1100° C for a sufficient period of time to react and convert the mixed vanadium sesquioxide and vanadium pentoxide particles to vanadium oxide and to form said glass-forming constituents into said glassy matrix binder.

4,056,379
FORMING V BENDS IN GLASS SHEETS BY PRESS BENDING

Joseph B. Kelly, and Kenneth A. Gibson, both of Crestline, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1977, Ser. No. 756,209
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—106 **12 Claims**



1. A method of bending a glass sheet into a shape which

includes a line of sharp bending about which the radius of curvature is less than 8 inches, comprising the steps of:

applying an electroconductive stripe onto a surface of a sheet of glass along a line of intended sharp bending;

heating the sheet of glass in a heated enclosure to an overall temperature suitable for bending;

removing the sheet of glass from said heated enclosure and passing electric current through the stripe so as to heat the line of intended sharp bending to a temperature higher than said overall temperature of the glass sheet; and

bending the sheet of glass to the desired curvature, including said sharp bend of less than 8 inches radius, by pressing it between two shaping members having shaping surfaces of complementary curvature.

9. An apparatus for bending a sheet of glass comprising:

a heated enclosure, including means to heat a sheet of glass to a softened condition suitable for bending;

a pair of opposed shaping members located outside said furnace and having complementary shaping surfaces conforming to the desired shape for the glass, including a line of sharp bending about which the radius of curvature is less than 8 inches;

means to bring the shaping members into pressing contact against opposite surfaces of a glass sheet supported therebetween;

means to convey a glass sheet into and out of said heated enclosure and into and out of pressing position between said shaping members;

a pair of electrodes located on opposite sides of the pressing position, said electrodes having means associated therewith for moving the electrodes into and out of contact with opposite edges of a glass sheet when the sheet is located between said pressing members; and

means for supplying electric current to the electrodes so that electric current may be passed along the line of sharp bending in the glass sheet while the glass sheet is positioned between the shaping members.

4,056,380
METHOD OF PRODUCING AN ORGANIC SOIL ADDITIVE AND THE PRODUCT THEREOF

E. Brandt Thiac, Lafayette, La., assignor to The Hydro-Terre Corporation, Lafayette, La.

Filed June 25, 1976, Ser. No. 696,790
Int. Cl.² C05F *11/08*
U.S. Cl. 71—9 **12 Claims**

1. The method of producing an organic soil additive for improving structural properties of soils comprising:

a. harvesting water hyacinths,

b. mixing secondary sewage sludge, animal or poultry manure and/or any combination of the three with water hyacinths in spaced apart heaps,

c. injecting air into the heaps to cut composting time, and

d. steam treating the composted mass to sterilize it.

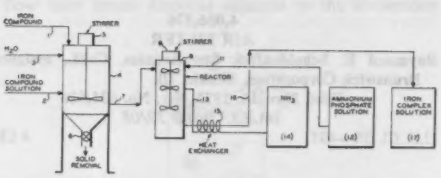
4,056,381
FERTILIZER SOLUTIONS CONTAINING STABILIZED IRON

Joseph R. Kenton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 14, 1976, Ser. No. 723,259
Int. Cl.² C05B *7/00*
U.S. Cl. 71—36 **15 Claims**

1. Substantially stable iron complexes comprising nitrogen, phosphorus, and iron, prepared by a process which comprises the step of:

a. contacting a water-soluble iron salt with an ammonium polyphosphate and water in a ratio sufficient to provide at least about 1:1 phosphorus atoms:iron atoms, thereby preparing an iron polyphosphate slurry, wherein said ammonium polyphosphate contains at least about 20 weight percent of the phosphorus atoms thereof in the poly form, and



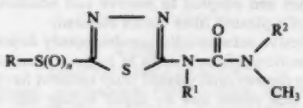
b. thereafter reacting said iron polyphosphate slurry from said step (a) with ammonia in amount sufficient to provide a substantially stable iron complex solution.

4,056,382
METHOD OF CONTROLLING AQUATIC WEEDS

Quentin Francis Soper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 531,582, Dec. 11, 1974, abandoned. This application June 9, 1976, Ser. No. 687,120
Int. Cl.² A01N *9/12*
U.S. Cl. 71—66 **8 Claims**

1. A method of destroying aquatic weeds in water which comprises contacting the weeds with an herbicidally-effective amount of a compound of the formula



wherein

R is C_1–C_8 alkyl, C_3–C_7 cycloalkyl, benzyl or phenethyl

R^1 is methyl or ethyl;

R^2 is hydrogen, methyl or ethyl; and

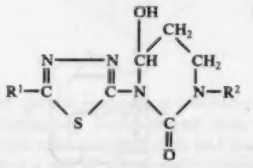
n is 0, 1 or 2.

4,056,383
THIAOIAZOLYLTETRAHYDROPYRIMIDINONE HERBICIDES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 505,118, Sept. 11, 1974, Pat. No. 3,979,388. This application June 14, 1976, Ser. No. 695,342
The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.
Int. Cl.² A01N *9/14*
U.S. Cl. 71—90 **9 Claims**

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein R^1 is selected from the group consisting of alkyl of up to 4 carbon atoms, lower alkenyl, lower chloroalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; and R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl and

wherein R^3 and R^4 are each selected from the group consisting of hydrogen and alkyl of up to 3 carbon atoms.

4,056,384

PESTICIDAL DIHYDROTETRAZOLO[1,5-a] QUINAZOLINES AND PESTICIDAL USES THEREOF

Raymond Alexander Bowie, Macclesfield; John Michael Cox; Gordon Michael Farrell, both of Wokingham, and Margaret Claire Shephard, Maidenhead, all of England, assignors to Imperial Chemical Industries Limited, London, England

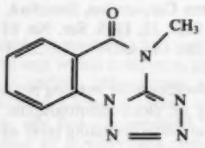
Filed Aug. 25, 1975, Ser. No. 607,543

Claims priority, application United Kingdom, Sept. 5, 1974, 38796/74

Int. Cl.[2] A01N *21/02*; C07D *487/04*

U.S. Cl. 71—92 2 Claims

1. A process for combating the disease Piricularia oryzae, rice blast, which comprises applying to rice seeds, rice plants, the roots of rice plants, or to their locus within or remote from a germination or growing environment, an effective amount of a dihydrotetrazolo[1,5-a]quinazoline having the structural formula:



and chemical name: 4 methyl-4,5-dihydro tetrazol[1,5-a]quinazolin-5-one.

4,056,385

ALANINE DERIVATIVES AS SUGAR CANE RIPENERS

Ronald W. A. Leach, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

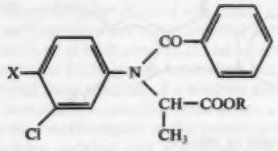
Filed Nov. 16, 1976, Ser. No. 742,320

Claims priority, application United Kingdom, Nov. 27, 1975, 48796/75

Int. Cl.[2] A01N *9/20*

U.S. Cl. 71—111 1 Claim

1. A method for effecting ripening of sugar cane which comprises applying to the growing plant an effective amount of a compound of the formula:



wherein X is chlorine or fluorine and R is hydrogen, an alkyl group containing 1 to 6 carbon atoms, or an alkali metal, alkaline earth metal, ammoniuum or alkyl-substituted ammonium ion.

4,056,386

METHOD FOR DECOMPOSING IRON PENTACARBONYL

William S. McEwan, Ridgecrest, Calif., and Hans B. Jonassen, New Orleans, La., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1977, Ser. No. 788,726

Int. Cl.[2] C21B *15/04*

U.S. Cl. 75—0.5 BA 4 Claims

1. In a method for producing iron comprising the steps of providing iron pentacarbonyl and subjecting the iron pentacarbonyl to an elevated temperature to cause it to decompose into iron and carbon monoxide the improvement residing in utilizing as a catalyst to speed the rate of decomposition, a gas selected from the group consisting of H_2, NO, PF_3, PH_3, NH_3 and I_2.

4,056,387

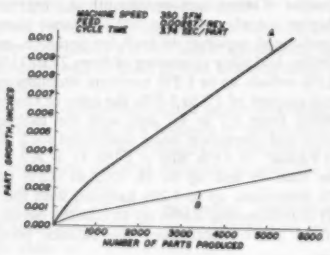
LEADED STEEL BAR FREE OF LEAD MACROINCLUSIONS

Gregorio Asua Cantera; Jose M. Palacios Reparaz, both of Bilbao, Spain, and Louis Molnar, Hammond, Ill., assignors to Inland Steel Company, Chicago, Ill. and S.A. Echevarria, Bilbao, Spain

Continuation of Ser. No. 497,258, Aug. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,065, Oct. 3, 1973, Pat. No. 3,876,422, which is a continuation-in-part of Ser. No. 256,806, May 25, 1972, abandoned. This application Dec. 8, 1975, Ser. No. 638,675

Int. Cl.[2] C22C *37/00*

U.S. Cl. 75—123 F 5 Claims



1. An as-rolled, free machining steel bar having ingredients consisting essentially of, in wt. %:

carbon	.03 – 1.03
manganese	.25 – 1.65
sulfur	.01 – .50
phosphorus	.005 – .20
silicon	.01 – .05
nitrogen	.03 max.
lead	.40 – .50
iron	essentially the balance;

the entire lead content of said bar being uniformly dispersed throughout said bar, with substantially all of said dispersed lead being contained in microinclusions;

said bar being substantially free of lead macroinclusions;

said steel bar having an immediate sub-surface region which comprises about 5–15% of the depth from the surface to the center of said bar;

said immediate sub-surface region being substantially free of complex macroinclusions comprising oxides of manganese, silicon and iron with metallic lead interspersed therein;

the form-tool machinability of said immediate sub-surface region, expressed in terms of cubic inches of metal re-

moved until tool failure, being greater than 50% of the form-tool machinability of the bar's interior.

4,056,388

PROCESS FOR UTILIZING FERROPHOSPHORUS

Jurgen Stenzel, Erftstadt-Liblar, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 27, 1976, Ser. No. 690,678

Claims priority, application Germany, May 31, 1975, 2524259

Int. Cl.[2] C22C *28/00;* C01B *25/01*

U.S. Cl. 75—129 2 Claims

1. A process for utilizing ferrophosphorus for the production of calcium phosphide, which comprises reacting ferrophosphorus with calcium silicide in proportions necessary to obtain a reaction mixture containing calcium and phosphorus in at least the stoichiometric quantities necessary for the formation of calcium phosphide Ca_3P_2 at temperatures of 1250° C up to 1500° C, allowing the resulting melt to gradually cool with the resultant formation of two separate phases consisting of ferrosilicon and calcium phosphide, respectively, and separating the said phases from one another.

4,056,389

NICKEL-CHROMIUM HIGH STRENGTH CASTING

Stuart Walter Ker Sutton Shaw, Coldfield, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed May 18, 1972, Ser. No. 254,728

Claims priority, application United Kingdom, May 20, 1971, 16046/71

Int. Cl.[2] C22C *19/05*

U.S. Cl. 75—171 3 Claims

1. A cast nickel-chromium alloy characterized by a good combination of stress-rupture strength at temperatures of 850° C. or higher together with marked resistance to embrittlement upon prolonged exposure to such temperature, and also good weldability, said alloy consisting of from 27 to 31% chromium, 10 to 25% cobalt, up to 1.9% niobium, titanium and aluminum in a total amount of 3.5 to 5.5%, the ratio of titanium to aluminum being from 1:1 to 4:1 and with the niobium, titanium, aluminum and chromium being correlated such that the "Correlated Factor" of 5 (% Nb) + 6 (% Ti + Al) + 2/3 (% Cr) is more than 49 and up to 54, 0.02 to 0.2% carbon, up to 0.025% zirconium, up to 1.2% hafnium with the %Zr + 1/2 (% Hf) not exceeding 0.6%, up to 0.002% boron, up to 0.2% of yttrium and/or lanthanum, the balance being essentially nickel.--

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4,056,390

PROCESS FOR TRANSFERRING ELECTROSTATIC LATENT IMAGES

Isao Iizaka, and Toshio Yamamoto, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 452,861, March 20, 1974, abandoned, which is a division of Ser. No. 330,722, Feb. 8, 1973, Pat. No. 3,824,012. This application Sept. 18, 1975, Ser. No. 614,387

Claims priority, application Japan, Feb. 17, 1972, 47-16816; Feb. 21, 1972, 47-21364

Int. Cl.[2] G03G *13/22*

U.S. Cl. 96—1 TE 10 Claims

1. A process of transferring an electrostatic latent image for electrophotography comprising the steps of:

a. forming the electrostatic latent image on a dielectric layer on the front face of a photoconductive plate having on its rear face an electrically conductive layer substantially grounded while the photoconductive plate is being driven by a drive member;

b. bringing copy paper onto the latent image bearing surface of the photoconductive plate by a first member to advance the copy paper with a small air gap maintained between the paper and the plate, the copy paper having on its rear face an electrically conductive lining layer having a high electric resistance of 10^5 to 10^{10} ohms and on its front face a dielectric layer, the first member serving substantially as a high resistance element having a higher electric resistance than the conductive lining layer, the transfer of the high potential portion of the latent image to the copy paper being initiated as the copy paper advances between the plate and the first member and being limited by the resistance of the first member;

c. injecting a transfer charge into the copy paper travelling along the photoconductive plate with a small air gap maintained therebetween by a second member grounded and having a lower electric resistance than the conductive lining layer of the copy paper, the low potential portion of the latent image being transferred to the copy paper as it traverses the second member whereas the copy paper is spaced from the latent image surface by the small air gap of at least 10 microns; and

d. separating the copy paper from the photoconductive plate after the paper has passed over the second member.

4,056,391

METHOD FOR ENHANCING SOLID SOLUTION STABILITY OF ELECTRON ACCEPTOR MOLECULES AND ELECTROPHOTOGRAPHIC COMPOSITIONS

Sam R. Turner, and John M. Pochan, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

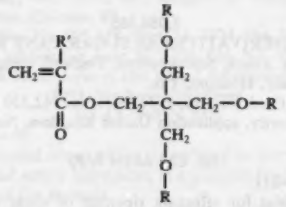
Filed Sept. 22, 1975, Ser. No. 615,665

Int. Cl.[2] G03G *5/06, 5/08*

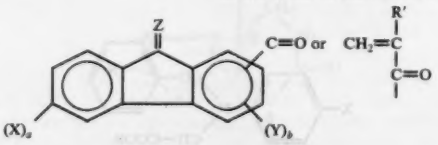
U.S. Cl. 96—1 PC 11 Claims

9. In an electrophotographic imaging process comprising the steps of providing an electrophotographic imaging member having a photoconductive insulating layer and forming a latent image on the surface of said photoconductive insulating layer, the improvement comprising;

an electrophotographic imaging member comprising a photoconductive insulating layer which comprises a solid solution of a polymeric resin and at least 25 weight percent of at least one compound of the formula



wherein R is



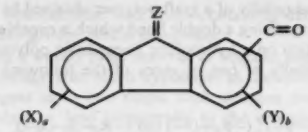
R' is hydrogen or methyl;

X and Y are independently selected from the group consisting of $-NO_2$, halogen, cyano and $-CF_3$;

Z is oxygen or dicyanomethylene; and

a and *b* can range from 0 to 3;

with the proviso that at least one of R is



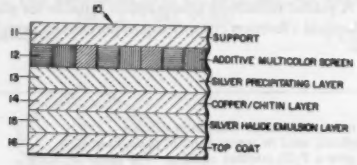
said electron acceptor compound having been exposed to a sufficient thermal energy, electromagnetic radiation and/or electron beam bombardment to effect polymerization of said compounds within the solid solution.

4,056,392

ADDITIVE COLOR SILVER SALT TRANSFER FILM UNIT WITH LAYER OF CHITIN AND CUPRIC SALT

Kenneth G. Scott, Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 17, 1976, Ser. No. 697,104
Int. Cl.² G03C *7/00, 5/54, 1/48, 1/84*
U.S. Cl. 96—3 **23 Claims**



15. A photographic process which comprises the steps of:

a. exposing a film unit which comprises, in order, a transparent support, an additive color screen, a layer comprising silver precipitating nuclei, a layer comprising a water soluble cupric salt and a compound selected from the group consisting of deacetylated chitin and 2-amino-2-deoxyglucose, and a photosensitive silver halide emulsion layer; and

b. contacting said exposed film unit with a processing composition containing a silver halide developing agent and a silver halide solvent adapted to provide a positive silver image in said layer comprising silver precipitating nuclei.

4,056,393

METHOD OF RECORDING INFORMATION USING A COPOLYMER OF GLYCIDYL METHACRYLATE AND ALLYL GLYCIDYL ETHER

Sheldon I. Schlesinger, East Windsor Township, Mercer County, N.J., and Veronica Cochran, Armonk, N.Y., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 509,679, Sept. 26, 1974, abandoned, which is a division of Ser. No. 297,829, Oct. 16, 1972, abandoned. This application June 17, 1976, Ser. No. 696,980
Int. Cl.² G03C *5/04, 1/78, 5/00*
U.S. Cl. 96—27 H **9 Claims**

1. A method for recording and storing information from a laser source comprising the steps of admixing (a) a copolymer of glycidyl methacrylate and allyl glycidyl ether having an inherent viscosity of at least about 0.25 and an epoxide equivalent of at least about 0.65 epoxide equivalent per 100 grams of polymer, derived from reaction of a mixture consisting essentially of the monomers containing from about a 4 to 5 molar excess of glycidyl methacrylate in the presence of a free-radical polymerization catalyst and a solvent at a temperature below about 100° C, and (b) as a latent curing catalyst, an aromatic diazonium salt of a complex halogenide which decomposes upon exposure to irradiation to release a Lewis Acid effective to initiate polymerization, said catalyst being present in an amount sufficient to effect polymerization of said copolymer and being selected from compounds having the general formula $(ArN_2)_m(MX_{n+m})^{-m}$ wherein Ar is an aryl or substituted aryl group, X is chlorine or fluorine, M is phosphorous, n is the oxidation state of M and m is the number of diazonium groups in the diazonium salt as determined by the net charge on the anion $(MX_{n+m})^{-m}$,

applying said mixture to a substrate, subjecting the surface of the coated substrate to a beam of coherent radiation emerging from a laser having an intensity at least sufficient to effect polymerization of said copolymer in said surface and applying a suitable solvent to remove unpolymerized portions from said surface.

4,056,394

TIMING LAYER FOR COLOR TRANSFER FILM UNITS COMPRISING COPOLYMER WITH ACTIVATION ENERGY TO PENETRATION GREATER THAN 18 KCAL/MOLE

David Eugene Hannie, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 14, 1976, Ser. No. 676,945
Int. Cl.² G03C *7/00, 5/54, 1/40, 1/76*
U.S. Cl. 96—29 D **22 Claims**

20. In a process of producing a photographic transfer image in color comprising:

a. imagewise exposing a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, a receiving layer and a barrier layer associated with a neutralizing layer being permeable by said alkaline processing composition and which is located between said photosensitive silver halide emulsion layer and said neutralizing layer to light;

b. treating said element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers;

i. an imagewise distribution of dye image-producing material being so formed as a function of development and

ii. at least a portion of said imagewise distribution of dye image-providing material diffusing to said dye image-receiving layer; and

c. neutralizing said alkaline processing composition by means of said neutralizing layer associated with said photographic element;

said film unit containing a silver halide developing agent, the improvement wherein said barrier layer comprises a polymeric latex having an activation energy to penetration from aqueous alkaline solution of greater than 18 kcal/mole, said polymeric latex comprising a polymer comprising from about 5 to about 35 percent by weight of polymerized ethylenically unsaturated monomer, from about 2 to about 10 percent by weight of polymerized ethylenically unsaturated carboxylic acid, and from about 55 to about 85 percent by weight of polymerized vinylidene chloride.

4,056,395

METHOD FOR PRODUCING A RELIEF PATTERN BY ION-ETCHING A PHOTOGRAPHIC SUPPORT

Masamichi Sato; Keishiro Kido, and Noboru Arai, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 19, 1975, Ser. No. 633,199
Claims priority, application Japan, Nov. 19, 1974, 49-132897
Int. Cl.² G03C *5/00*
U.S. Cl. 96—36 **12 Claims**

1. A method for producing a relief pattern comprising in sequence forming one of (i) a silver image, (ii) a silver halide image, and (iii) an image obtained by toning and/or intensifying said silver image in the emulsion layer of a photographic light-sensitive material which comprises a support having

thereon at least one silver halide emulsion layer either directly or on at least one subbing layer on the support by image-wise exposure to light and developing; heating said photographic material at a temperature greater than 150° C to thermally decompose the binder of said emulsion layer; and then ion-etching the photographic material to form a relief pattern in the support corresponding to said image.

4,056,396

LAYERS USED TO PREVENT RETICULATION IN PHOTOGRAPHIC ELEMENTS

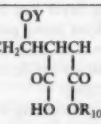
Ikutaro Horie; Takushi Miyazako; Shinji Sakaguchi; Nobuo Tsuji, and Nagao Kameji, all of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 441,781, Feb. 12, 1974, abandoned. This application May 16, 1975, Ser. No. 578,069
Claims priority, application Japan, Feb. 12, 1973, 48-17273
Int. Cl.[2] G03C *1/76, 3/00*

U.S. Cl. 96—67 **10 Claims**

1. A photographic silver halide light-sensitive element including a support a light sensitive silver halide layer and, a non-light sensitive uppermost layer said uppermost layer not containing gelatin, not delaminating from said light-sensitive material when subjected to a processing solution selected from the group consisting of a developing solution, water, a fix-bleaching solution, a stopping solution, a fixing solution and a stabilizing solution and comprising polymer (F) comprising repeating unit f_1

f_1:



wherein Y represents $—CH_3$ or $—COCH_3$, R_{10} represents —H or $—C_nH_{2n+1}$, n being an integer of 1 to 12, and at least one unexposed silver halide light-sensitive layer between said support and said uppermost layer, said polymer (F) being insoluble in any of said processing solutions used during processing, and the thickness of said layer being sufficient to prevent reticulation.

4,056,397

DYE DIFFUSION TRANSFER MATERIAL WITH GRAFT POLYMER BINDING LAYER

Werner Krafft; Erich Wolff, and Wulf von Bonin, all of Leverkusen, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Nov. 5, 1975, Ser. No. 629,104
Claims priority, application Germany, Nov. 9, 1974, 2453208
Int. Cl.[2] G03C *1/40, 1/48, 1/90*

U.S. Cl. 96—77 **3 Claims**

1. Photographic monosheet material for the dye diffusion transfer process, containing the following layers in the given sequence between a first and a second dimensionally stable support layer, of which at least the first is transparent:

a. an image receiving layer,

b. a light reflecting pigment layer or means for producing such a light reflecting pigment layer and

c. a light-sensitive layer unit containing at least one light-sensitive silver halide emulsion layer with which a colour producing compound is associated,

and a destructible container containing processing liquid arranged at the side, which container releases its contents between a first and second binder layer of the monosheet material when subjected to mechanical force, a bond existing between the said first and said second binder layer of the monosheet material before and after processing, which bond is temporarily eliminated under the action of the processing liquid, wherein the improvement comprises between said first layer and said second layer there is arranged another layer which consists substantially of a graft polymer obtained by grafting a monomer containing a double bond which is capable of radical polymerisation on a hydrophilic linear basic polymer consisting substantially of one or more of the following recurrent units:

$$(—R_1—O—),\ (—R_2—O—) \text{ and } (—R_3—O—CO—)$$

in which R_1, R_2 and R_3 each represents an alkylene group containing 1 to 8 carbon atoms, and having a molecular weight of between 2000 and 10,000.

4,056,398

PLASTIC REFRACTORY COMPOSITION SUITABLE FOR PLACEMENT BY VIBRATING AND THE USE THEREOF

Harold L. Rechter, Chicago, and James R. Haligarda, Oak Forest, both of Ill., assignors to Chicago Fire Brick Company, Chicago, Ill.

Filed Mar. 31, 1977, Ser. No. 783,271
Int. Cl.[2] C04B *35/10*

U.S. Cl. 106—65 **9 Claims**

1. A plastic refractory composition suitable for placement by mechanical vibration comprising in percent by weight on a dry basis:

	%
-325 mesh alumina or aluminum silicate	20–45
Phosphoric acid or water soluble phosphate to give a P_2O_5 content equal to 75% phosphoric acid	3–12
Bentonite	1.2–3
Kaolin clay	0–1
Tetrasodium pyrophosphate	0.2–1.5
Alumina or aluminum silicate aggregates, ¼ inch maximum size	balance.

4,056,399

ACID AND HEAT RESISTANT MORTARS FOR CELLULAR GLASS BODIES

John Kirkpatrick, Trafford, and John Kijowski, Bradford, both of Pa., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed May 6, 1976, Ser. No. 683,754
Int. Cl.[2] C04B *35/14*

U.S. Cl. 106—69 **13 Claims**

1. An acid-resistant mortar composition for bonding cellular glass bodies consisting essentially of a mixture expressed by percentage weight of finely powdered reactive glass in the range between about 26 and 48 percent, said powdered reactive glass having substantially the same composition as said cellular glass bodies, inert aggregate filler in the range between about 26 and 61 percent, and a silica sol binder in the range between about 13 and 26 percent.

4,056,400

OXIDATION PRODUCTS OF CELLULOSE, HEMICELLULOSE AND LIGNIN

Michael Diamantoglou, Erlenbach; Helmut Magerlein, Obernburg; Rainer Zielke, Erlenbach, all of Germany, and Emery George Philomena Cornelissens, Nootdorp, Netherlands, assignors to Michael Diamantoglou, Erlenbach; Helmut Mägerlein, Obernburg and Rainer Zielke, Erlenbach, all of, Germany

Filed July 28, 1975, Ser. No. 599,364
Claims priority, application Germany, July 31, 1974, 2436843
Int. Cl.[2] C08L *1/00*

U.S. Cl. 106—162 **13 Claims**

1. A process for the production of a mixture consisting primarily of oligomeric and polymeric oxidation products of

cellulose, hemicellulose and lignin containing carboxy, ether and hydroxy groups which comprises:

oxidizing a woody plant material in aqueous suspension in a single stage with alkali hypohalite as the essential oxidizing agent or in two stages with nitrogen dioxide, alkali periodate or lead tetraacetate as the essential oxidizing agent of the first stage and with alkali chlorite or alkali hypochlorite as the essential oxidizing agent in the second stage, the total amount of oxidizing agent being at least two parts by weight for each part by weight of said woody plant material;

separating undissolved components; and

precipitating the oxidation products from the aqueous medium by means of a water-miscible organic precipitating agent.

4,056,401

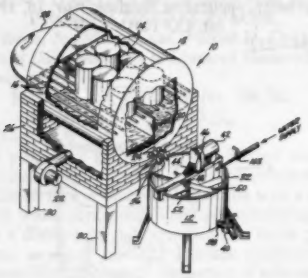
ASPHALT EMULSION AND MANUFACTURE THEREOF

Bjorn N. DeBough, 8011 1st NE., Seattle, Wash. 98115

Continuation-in-part of Ser. No. 376,727, July 5, 1973, abandoned. This application May 23, 1975, Ser. No. 580,366

Int. Cl.² C08L *95/00*

U.S. Cl. 106—277 **2 Claims**



1. A method for preparing an asphaltic emulsion consisting of clay, asphalt and water which comprises: preparing a slurry, at ambient temperature, consisting of water of a hydrophilic clay having a particle size not exceeding about 0.002 inches and capable of absorbing from up to about ten times its weight of water to about its own weight of water; preheating an asphalt having a range of 40 to 300 penetration to a temperature within the range from about 375° F. to about 400° F.; and, admixing said slurry with said asphalt while agitating at a mixing speed of between 50 and 90 r.p.m. to emulsify the slurry and asphalt into a lather having an increase in volume of about 18 percent.

4,056,402

DRY WATER-DISPERSIBLE PIGMENT COMPOSITIONS

John Guzi, Jr., Argyle, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 24, 1976, Ser. No. 717,415

Int. Cl.² C08L *1/26*; C09C *3/08*

U.S. Cl. 106—308 Q **10 Claims**

1. A dry, non-dusting, water-dispersible pigment composition developing upon stirring in water-borne industrial finish systems good strength and color values, said composition consisting essentially of from 55 to 80% of pigment and, based on the pigment weight, from 15 to 45% of a nonionic dispersing agent of the polyether alcohol type, alkylene oxide-alkylene diamine block polymer type or polyoxyethylene glycol or glycerol ester type and from 10 to 67% of at least one water-soluble, nonionic cellulose ether having a viscosity of less than 1000 cps. as measured on a 2% aqueous solution at 25° C.

4,056,403

SOLVENT COMPOSITION USED TO CLEAN POLYURETHANE FOAM GENERATING EQUIPMENT

Robert J. Cramer, West Haven, and Maurice A. Raymond, Northford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 27, 1976, Ser. No. 690,448

Int. Cl.² C23G *3/04*; B08B *3/04*

U.S. Cl. 134—22 R **13 Claims**

1. In a method for cleaning polyurethane foam generating equipment which comprises purging or rinsing said equipment or a portion thereof with a solvent, the improvement of using as said solvent a composition which is comprised of

a. a halogentated aliphatic hydrocarbon having 1–12 carbon atoms and containing only carbon, hydrogen, and halogen atoms in the molecule and

b. an aliphatic monohydric alcohol having 1–20 carbon atoms and containing only carbon, oxygen, hydrogen and optionally halogen atoms in the molecule,

the weight ratio of (a):(b) ranging from about 1:1 to about 12:1.

4,056,404

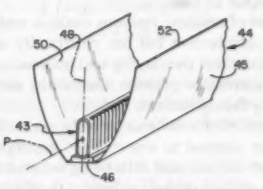
FLAT TUBULAR SOLAR CELLS AND METHOD OF PRODUCING SAME

Lynne C. Garone, Cambridge, and Kramadhati Venkata Ravi, Sudbury, both of Mass., assignors to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Filed Mar. 29, 1976, Ser. No. 671,610

Int. Cl.² H01L *31/06*

U.S. Cl. 136—89 PC **10 Claims**



1. A solar cell unit comprising in combination:

a substantially monocrystalline semi-conductor body in the form of a substantially flat oval tube having first and second opposed and mutually spaced flat side wall sections connected together by a pair of opposed edge sections, said side wall sections being substantially larger than said edge sections;

said tube having a radiation-receiving outer surface and a photo-voltaic junction which is close to said outer surface and is capable of responding to radiant energy passing through said surface, said outer surface being substantially flat along the length and breadth of said side wall sections; and

at least first, second and third electrodes for coupling said unit to an external circuit;

said first and third electrodes (1) being carried on said first and second flat side wall sections, respectively, of said radiation receiving outer surface, and (2) each comprising a plurality of spaced conductors, and said second electrode being carried by an inner surface of said body.

7. A method of producing a solar cell unit comprising the steps of:

a. providing a substantially monocrystalline body of a semiconductor material in the form of a flat oval tube having a pair of opposed mutually spaced flat side wall sections connected together by a pair of opposed edge sections, said side wall sections being substantially larger than said edge sections;

b. forming a photo-voltaic junction near the outer surface of said tube along said side wall sections and said edge sections; and

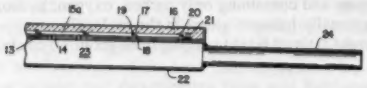
c. forming electrodes on the outer and inner surfaces of said side wall sections, with separate electrodes being formed on the outer surfaces of each of said flat side wall sections.

4,056,405

PANEL FOR SOLAR ENERGY CELLS

Peter F. Varadi, Rockville, Md., assignor to Solarex Corporation, Rockville, Md.

Filed May 10, 1976, Ser. No. 684,848
Int. Cl.² H01L *31/04*
U.S. Cl. 136—89 PC **10 Claims**



1. A panel for mounting solar energy cells for exposure to light in a terrestrial environment while mitigating impairment of cell efficiency due to excessive heat generated by the light, comprising

a. a housing for retaining the cells, said housing comprising side and end walls and a wall intersecting said side and end walls and forming an upwardly open recessed top to said housing, said intersecting wall being formed from a good conductor of heat,

b. a sheet of resilient resinous cushion material that is thermally conductive but has electrically insulating properties, said sheet overlaying said intersecting wall and being in heat-transfer position therewith, and having an outwardly facing surface, and

c. a plurality of solar energy cells, each of which has a top surface adapted to absorb light impinging thereon and a bottom surface, said cells being secured to said outwardly facing surface of said cushion at their bottom surfaces and, as so secured, being in a position whereby light impinging on the junctions of said cells will generate a flow of electricity that will not be dissipated by said cushion, but heat generated by said light will be carried by said cushion from the immediate vicinity of said cells and transferred to said heat-conductive intersecting wall.

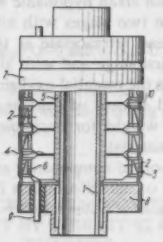
4,056,406

TUBULAR THERMOELECTRIC MODULE

Mikhail Abramovich Markman, ulitsa Shirokaya, 1, korpus 2, kv. 264; Leonid Mikhailovich Simanovsky, ulitsa 3 Mytischinskaya, 14, kv. 18; Igor Rostislavovich Jurkevich, Michurinsky prospekt, 74, kv. 116; Nikolai Vasilievich Kolomoets, Kastanaevskaya ulitsa, 61, korpus 1, kv. 22, all of Moscow; Vyacheslav Tikhonovich Kamensky, Sovetsky prospekt, 26, kv. 112, Ivanteevka Moskovskoi oblasti; Igor Mikhailovich Matskov, ulitsa Festivalnaya, 22, korpus 3, kv. 263, and Sergei Ilich Maximov, ulitsa Shirokaya, 24, kv. 26, both of Moscow, all of U.S.S.R.

Filed Jan. 15, 1975, Ser. No. 541,322
Int. Cl.² H01L *35/02*
U.S. Cl. 136—208 **7 Claims**

1. A tubular thermoelectric module comprising an inner thermal conductor; circular thermopiles embracing said inner thermal conductor; connecting strips interconnecting said thermopiles; an outer thermal conductor in the form of a number of taper clamps, each of said taper clamps including an unbroken outer ring and a split inner ring, each embracing a respective one of said thermopiles; and electric insulation units



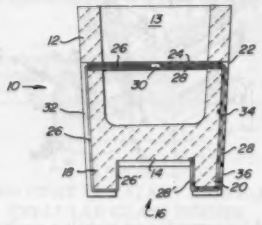
serving to insulate one thermopile from another and from said inner and outer thermal conductors.

4,056,407

THERMOCOUPLE

Omer P. Cure, Diepenbeek, Belgium, assignor to Electro-Nite Co., Philadelphia, Pa.

Filed Mar. 31, 1976, Ser. No. 672,100
Claims priority, application Belgium, Nov. 18, 1975, 54658
Int. Cl.² H01V *1/04*
U.S. Cl. 136—232 **6 Claims**



1. A thermocouple assembly comprising a cup of refractory material having oppositely disposed walls, a quartz tube extending across the interior of said cup, opposite ends of said tube passing through and being supported by said oppositely disposed walls, dissimilar metal thermocouple wires having an OD less than the ID of said tube welded together at a hot junction within said quartz tube, only said hot junction weld being in contact with substantially 360° of the inner circumference of said tube adjacent said weld, each thermocouple wire extending from a discrete opposite end of said tube, an exterior surface of said cup supporting the free ends of said thermocouple wires as exposed contacts, and means for electrically insulating at least one of said thermocouple wires from said cup.

4,056,408

REDUCING THE SWITCHING TIME OF SEMICONDUCTOR DEVICES BY NUCLEAR IRRADIATION

John Bartko, Monroeville, and Kuan H. Sun, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

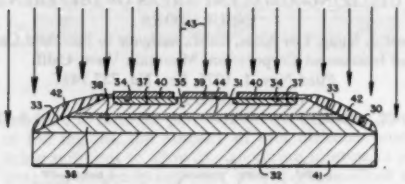
Filed Mar. 17, 1976, Ser. No. 667,791
Int. Cl.² H01L *21/26*
U.S. Cl. 148—1.5 **28 Claims**

1. A method of reducing the switching time of certain semiconductor devices comprising the steps of:

A. determining the depth of maximum defect generation in a given type of semiconductor device having a blocking PN

junction on irradiation with a given radiation source radiating particles with molecular weight of at least one;

B. adjusting the energy level of said radiation source to provide the depth of maximum defect generation adjacent a blocking PN junction of said type of semiconductor device;



C. positioning at least one semiconductor device of said given type with a major surface thereof to be exposed to said adjusted radiation source; and

D. thereafter irradiating said semiconductor device with said adjusted radiation source to a given dosage level reducing the switching time of said semiconductor device.

4,056,409

INCREASING TOPCOAT ADHESION FOR SOLVENT PHOSPHATIZED SURFACES

Edward A. Rowe, Jr., Mentor, and William H. Cawley, Painesville, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed July 28, 1976, Ser. No. 709,263
Int. Cl.[2] C23F *7/10*
U.S. Cl. 148—6.15 R **16 Claims**

1. In the process of forming a phosphatized coating on a metal substrate, wherein coating formation proceeds through contact of the surface of said metal substrate with a methylene chloride and water-containing liquid phosphatizing composition having a continuous and homogeneous liquid phase containing water in minor amount, with the composition being capable of forming a phosphatized coating of substantial water insolubility on said surface, the improvement for forming on said surface a phosphate coating having enhanced topcoat adhesion, which improvement comprises adjusting the specific gravity of said liquid phosphatizing composition to between about 1.12 and about 1.14, as determined at a temperature within the range of from about 95° to about 105° F, by blending with said composition a constituent selected from the group consisting of water, aprotic polar organic compound, solubilizing solvent capable of solubilizing phosphoric acid in methylene chloride, and mixtures thereof, whereby the blending provides the resulting phosphatizing composition with water in an amount above about 4 weight percent, basis total weight of the composition, and then contacting the surface to be coated with the resulting phosphatizing composition.

4,056,410

PROCESS FOR PREPARING ACICULAR IRON POWDERS CONTAINING TITANIUM AND TIN, AND THE RESULTING POWDERS WHEN SO PREPARED

Ariello Rolando Corradi, Romentino Novara, and Giuliano Fagherazzi, Novara, both of Italy, assignors to Montedison, S.p.A., Milan, Italy

Filed Nov. 28, 1975, Ser. No. 635,985
Claims priority, application Italy, Nov. 29, 1974, 30014/74
Int. Cl.[2] H01F *1/02*
U.S. Cl. 148—105 **9 Claims**

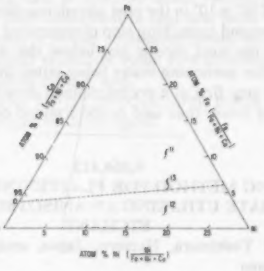
1. A process for preparing metallic powders based on iron and suitable for magnetic recording, starting from acicular particles of an iron compound selected from the class consisting of α-Fe_2O_3, α-FeOOOH, and Fe_3O_4, comprising the sequential steps of (a) adding to the said acicular particles of the iron compound titanium, in the form of $TiO(OH)_2$ or TiO_2, and tin, in the form of $Sn(OH)_2$ or $SnO(OH)_2$; (b) thereafter subjecting same to at least one treatment in air at 400°–550° C,; and finally (c) subjecting the mixture to reductionat 340°–420° C with a gas containing more than 50% by volume of hydrogen; the titanium being introduced into the particles of the iron compound in an amount of 0.5 – 1% by weight, calculated as TiO_2, and the tin being introduced in an amount of 3 – 6% by weight, these percentages being referred to pure iron.

4,056,411

METHOD OF MAKING MAGNETIC DEVICES INCLUDING AMORPHOUS ALLOYS

Ho Sou Chen, 3 Arrighi Drive, Warren, N.J. 07060; Ernst Michael Gyorgy, 6 Woodcliff Drive, Madison, N.J. 07940; Harry John Leamy, 480 Charnwood Road, and Richard Curry Sherwood, 8 Vista Lane, both of, New Providence, N.J. 07974

Filed May 14, 1976, Ser. No. 686,456
Int. Cl.[2] H01F *1/00*; C22B *43/00*
U.S. Cl. 148—121 **2 Claims**



1. Method for the production of a device comprising

a. forming a filament consisting essentially of an amorphous low magnetostrictive metallic alloy of the composition $(Co_aFe_bT_c)_iX_j$ wherein

i. T is at least one first species selected from the group consisting of Ni, Cr, Mn, V, Ti, Mo, W, Nb, Zr, Pd, Pt, Cu, Ag, Au;

ii. X is at least one second species selected from the group consisting of a first subgroup, consisting of P, Si, B, C, As and Ge and a second subgroup consisting of Al, Ga, In, Sb, Bi and Sn;

iii. i is from 0.7 to 0.9;

iv. $i + j = 1$;

v. a is from 0.7 to 0.97; and

vi. b is from 0.03 to 0.25 with $a + b + c = 1$,

b. winding the filament to produce a magnetic body,

c. heat treating the magnetic body at a heat treatment temperature above its Curie temperature and below its glass transition temperature for at least one minute, which heat treatment temperature is selected to yield a body of improved magnetic permeability,

d. immediately immersing the body in a liquid, and

e. incorporating the body in the device by a method including magnetically coupling the body to an electrically conductive path.

4,056,412

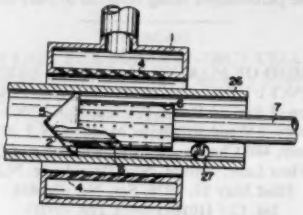
METHOD FOR HARDENING STEEL PIPES

Yoshihisa Fujii, and Akio Fujiwara, both of Wakayama, Japan, assignors to Sumitomo Metal Industries Limited, Osaka City, Japan

Division of Ser. No. 471,543, May 20, 1974, Pat. No. 3,937,448. This application Sept. 12, 1975, Ser. No. 612,927
Int. Cl.[2] C21D *9/08*
U.S. Cl. 148—153 **3 Claims**

1. A method of hardening steel pipes by quenching the inside

surface and the outside surface of a steel pipe by jetting quenching water from the outside and inside of the pipe comprising, a first quenching step of jetting quenching water to the outside surface of the steel pipe at an angle of $30° \pm 10°$ in the pipe advancing direction of the pipe axis, said first step commencing when the steel pipe has a heating temperature above the A_3 transformation point, and a second quenching step of



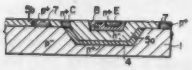
jetting quenching water to the inside surface of the steel pipe at an angle of $30° \pm 10°$ in the pipe advancing direction of the pipe axis, said second quenching step commencing when said inside surface of the steel pipe is just below the A_1 transformation point and the quenching water being jetted during said second quenching step first at a predetermined density and thereafter at a density lower than said predetermined density.

4,056,413

ETCHING METHOD FOR FLATTENING A SILICON SUBSTRATE UTILIZING AN ANISOTROPIC ALKALI ETCHANT

Masayoshi Yoshimura, Hamura, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 5, 1976, Ser. No. 729,710
Claims priority, application Japan, Oct. 6, 1975, 50-119768
Int. Cl.[2] H01L *21/302, 21/20, 21/76*
U.S. Cl. 148—175 **10 Claims**



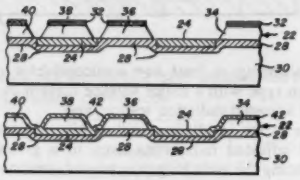
1. An etching method for flattening a silicon substrate wherein an epitaxial silicon layer is grown on the (100) crystal face of the silicon single-crystal substrate, the silicon single-crystal substrate having a depressed portion in its principal face, and etching for flattening the epitaxial silicon layer is carried out; said method comprising the steps of forming said epitaxial silicon layer to such a sufficient thickness that a position at which side surfaces of a new depressed portion to be formed in a surface of said epitaxial silicon layer, said side surface having a crystal face (111), intersect becomes at least a final surface of the etching, and subjecting said epitaxial silicon layer to anisotripic etching with an alkali etchant down to said final surface.

4,056,414

PROCESS FOR PRODUCING AN IMPROVED DIELECTRICALLY-ISOLATED SILICON CRYSTAL UTILIZING ADJACENT AREAS OF DIFFERENT INSULATORS

Robert J. Kopp, Los Altos, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Nov. 1, 1976, Ser. No. 737,749
Int. Cl.[2] H01L *21/20, 21/76*
U.S. Cl. 148—175 **9 Claims**



1. A method for fabricating single-crystal silicon films dielectrically isolated from each other and from a common substrate by silicon dioxide and silicon nitride insulating films, said method comprising the steps of:

epitaxially growing a silicon film to a thickness of approximately four micrometers on the surface of a heavily-doped n-type single-crystal silicon wafer;

coating the surface of said silicon film with a first dielectric material to a thickness of approximately 0.2 micrometers;

masking all portions of the surface of said first dielectric material that are to be retained for dielectric isolation and removing all portions of said first dielectric material that are not masked and are to be isolated by a second dielectric material;

coating the areas on the surface of said silicon film that have been exposed by the removal of portions of said first dielectric material with a second dielectric material;

depositing on the exposed surfaces of said first and second dielectric materials a relatively thick supporting layer of polycrystalline silicon;

removing said heavily-doped n-type silicon wafer by electrochemically etching it from said epitaxially-grown silicon film;

vapor thinning said silicon film to a desired thickness; and

selectively etching through said silicon film to form individual single-crystal device islands on said first and second dielectric materials.

4,056,415

METHOD FOR PROVIDING ELECTRICAL ISOLATING MATERIAL IN SELECTED REGIONS OF A SEMICONDUCTIVE MATERIAL

Charles R. Cook, Jr., North Palm Beach; Aung San U, and Raymond E. Scherrer, both of West Palm Beach, all of Fla., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Division of Ser. No. 601,855, Aug. 4, 1975, abandoned. This application July 15, 1976, Ser. No. 705,632
Int. Cl.[2] H01L *21/20*
U.S. Cl. 148—187 **39 Claims**

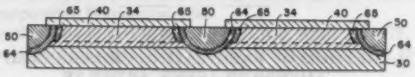
1. A method for providing electrical isolation regions in a semiconductive material, comprising the steps of:

forming a protective layer on a surface of the semiconductive material;

removing the protective layer in said regions to expose the semiconductive material; and

forming a porous dielectric material from at least a portion

of the semiconductive material in the regions by submerging the semiconductive material into an anodizing solution and applying and anodizing potential to the semiconductive material so that the exposed semiconductive material in the regions becomes an anode and is at least partially



anodized to form the porous dielectric insulating material in the regions, the porosity of said dielectric material being sufficient to allow the anodizing solution to penetrate the dielectric and react with the unanodized semiconductive material in said regions, whereby the isolation regions may be formed to a desired thickness.

4,056,416

RADIATION POLYMERIZED PRIMING COMPOSITIONS

Gerald B. Franklin, Philadelphia, Pa., and Clyde F. Parrish, Terre Haute, Ind., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 1, 1975, Ser. No. 636,387
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.91 **10 Claims**

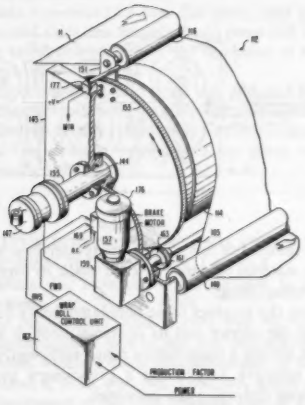
8. An irradiation polymerized priming composition of admirable percussion sensitivity and low dusting properties comprising by weight about 32–42% normal lead styphnate, about 14–16% antimony sulfide, about 30–33% barium nitrate, about 3.9–4.1% tetracene, about 6–8% aluminum powder, and about 4½–8% binder comprising methyl methacrylate and trimethylolpropanetrimethacrylate.

4,056,417

OPEN LOOP HEATING CONTROLLER AND METHOD FOR CORRUGATORS

John S. League, IV, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 29, 1975, Ser. No. 608,980
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—64 **14 Claims**



1. In a corrugating machine for the production of double-face corrugated paperboard by joining a flat paper web to one side of a corrugated medium to form a single-face web and joining a second flat paper web to the opposite side of the corrugated medium to form the double-face corrugated paperboard, apparatus for heating the webs as a function of only one production factor of the corrugator machine and without a feedback signal comprising:

at least one rotatably journaled heating roll for receiving a web in contact with a circumferential area of the roll;

means positionable relative to the heating roll for varying the circumferential area of contact between the web and the roll; and,

control circuit means for positioning the positionable means relative to the heating roll in response to only one production factor of the corrugating machine, said control circuit means comprising:

means for sensing said one production factor of the machine and for generating a signal related to said sensed production factor;

means for periodically sampling said generated production factor related signal;

means for storing the sampled production factor related signal at a first time;

means for comparing said stored production factor related signal with said production factor related signal sampled at a time subsequent to said first time;

means responsive to said comparing means for generating a drive signal related in value to a difference between the compared signals; and,

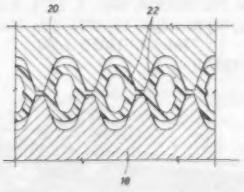
drive means for driving the positionable means in response to said generated drive signal.

4,056,418

PROCESS FOR MAKING HOLLOW FIBERS

Frank M. Aspin, Knutsford, England, assignor to Shell Oil Company, Houston, Tex.

Filed May 6, 1975, Ser. No. 574,652
Claims priority, application United Kingdom, May 8, 1974, 20198/74
Int. Cl.[2] B32B *31/08, 31/18;* B29D *7/24;* D01D *5/24*
U.S. Cl. 156—145 **6 Claims**



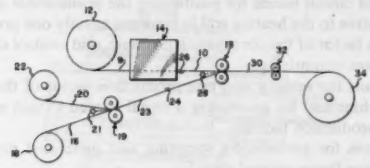
1. A process for making hollow fibers which comprises (a) simultaneously passing at least two molecularly orientable plastic films through a pressure nip between two rollers, said plastic films being at or above their fusion temperature at least at the point where the films come in contact with said rollers, said rollers having from 15 to 60 peripheral annular grooves per inch with lands of no more than about 0.0015 inch width therebetween, the grooves in the respective rollers being accurately aligned so that the lands of each roller are in the same planes cutting the circumference of the roller, so that the films are fused together at the point they contact the lands and are kept apart by air trapped between the films in the non-fused area, (b) cooling the fused films below the fusion temperature of the molecularly orientable plastic, (c) stretching the fused films and treating the stretched film so as to cause the fused films to fibrillate.

4,056,419

METHOD AND BELT OF ORIENTED NYLON WITH RUBBER SHEET ADHERED THERETO

Ellis H. Paine, Woodstock, Conn., assignor to Moldex, Inc., Wauregan, Conn.

Filed Dec. 1, 1975, Ser. No. 636,730
Int. Cl.[2] B32B *31/08*; C09J *5/02*
U.S. Cl. 156—164 **1 Claim**



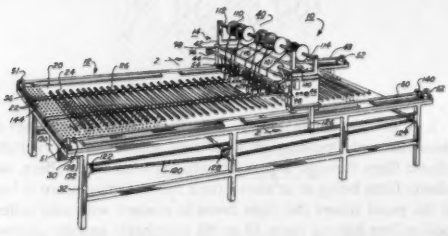
1. The method of producing a high tensile strength laminated belt which is adapted to contact a driving pulley comprising, the steps of, heat-bonding a surface layer of nylon to a sheet of rubber to form a laminate thereof having at least the length and width desired in the completed belt, forming a sheet of high tensile strength oriented nylon of at least the length and width desired in the completed belt, passing said sheets longitudinally along paths toward each other in substantially transverse alignment to a mating position wherein one surface of said sheet of oriented nylon moves into contact with the exposed surface layer of nylon which has been heat-bonded to said sheet of rubber, depositing a liquid which activates nylon onto said exposed surface of said surface layer and said one surface of said sheet of oriented nylon to thereby activate the respective surfaces which are moved together, and exerting pressure and heat progressively against the exposed surfaces of said sheets of nylon and rubber at the zone where they move together at a temperature which is sufficient to insure the bonding of said surface layer to said sheet of oriented nylon and which is below the critical temperature at which the orientation of said sheet of oriented nylon would be impaired substantially.

4,056,420

HEATING STRUCTURE FABRICATING MACHINE AND METHOD

Gerald E. Adams, Mishawaka, Ind., assignor to Bristol Products, Inc., Bristol, Ind.

Division of Ser. No. 503,924, Sept. 6, 1974, Pat. No. 3,964,959. This application Jan. 19, 1976, Ser. No. 650,050
Int. Cl.[2] H05B *3/00*
U.S. Cl. 156—181 **7 Claims**



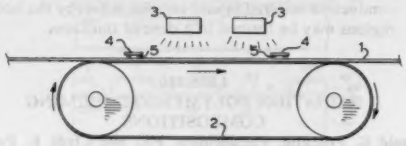
1. A method of fabricating a heating structure using a heating element, the steps comprising arranging a heating wire with a thermoplastic outer layer in a predetermined pattern with transverse spaced sections, feeding a strand having a thermoplastic outer layer progressively to said sections in an angular, crosswise relationship while said strands and sections are below the temperature at which the surface thereof fuses, heating by direct contact with said heating element only the areas of said wire sections which are to be joined to the strand, to the fusion point before said strands and sections contact one another simultaneously heating said strands with said heating element to provide a fused area in the proximity of each of said heating wire sections, and pressing said fused areas of the strand and respective section together to form a bond between said wire and strand.

4,056,421

METHOD OF FABRICATING CROSSLINKED THERMOPLASTICS ARTICLES

Harold F. Jarvis, Moffat, Canada, assignor to Shaw Pipe Industries Ltd., Toronto, Canada

Filed Jan. 10, 1977, Ser. No. 758,161
Int. Cl.[2] B29C *19/02*; C09J *5/00*
U.S. Cl. 156—272 **7 Claims**



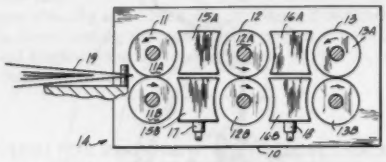
1. A method of fabricating crosslinked synthetic plastics articles comprising providing crosslinkable synthetic thermoplastics material in sheet form, crosslinking areas of the sheets to a controlled degree of crosslinking by exposing them to crosslink-inducing radiant energy while providing relatively uncrosslinked portions thereon by masking selected areas of the sheets with masking material relatively opaque to the radient energy, shaping the crosslinked sheets into a more complex configuration and bringing relatively uncrosslinked portions of the sheets into contact, fusing the contacted portions together under heat and pressure, and locally applying crosslink-inducing energy to the fused portions.

4,056,422

TWO STAGE OVEN LAMINATOR METHOD

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed June 6, 1975, Ser. No. 584,374
Int. Cl.[2] C09J *5/00*
U.S. Cl. 156—309 **5 Claims**



1. The method of laminating a polyester-heat sealable adhesive film material to paper or card stock to form a laminated product comprising:

inserting the product to be laminated into a carrier,

passing the carrier and its contents through a first heating zone having a temperature range sufficiently high to melt the adhesive to provide a preliminary superficial tack without distorting the polyester.

passing the heated carrier and product through a pair of pressure laminating rolls,

then passing the carrier and its contents through a second heating zone having a temperaure range higher than the temperature range in said first heating zone to further melt the adhesive and then passing the carrier and product

through a second pair of laminating rolls to effect lamination of the adhesive to the card stock without polyester distortion

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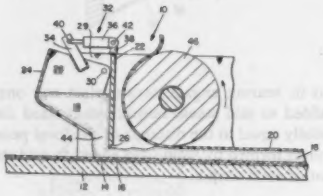
4,056,423
PLATEMAKING APPARATUS

Norman Edward Hughes, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 571,030, April 23, 1975, abandoned. This application May 20, 1976, Ser. No. 688,451
Int. Cl.² B05C *9/12, 11/04*
U.S. Cl. 156—356 **3 Claims**



1. In combination with photopolymer platemaking apparatus wherein a horizontal flat plate, a photo transparency on said flat plate, a cover film on said photo transparency, and a movable carriage to traverse said flat plate, said carriage having photopolymer supply means, a press roll and backing sheet supply means all mounted on said carriage, are provided for making a photorelief printing plate, wherein the improvement comprises:

a substantially vertical plate connected to said carriage, said vertical plate acting as a back wall and as a doctor blade;

scoop means abutting said vertical plate and being movable with respect to said vertical plate, movement of said scoop means with respect to said vertical plate defining a bottom opening between said scoop means and said vertical plate to control the flow of photopolymer therethrough;

actuator means interconnecting said scoop means and said vertical plate to control the speed and amount of movement of said scoop means with respect to the vertical plate and the resulting opening between said scoop means and said vertical plate, whereby said opening provides uniform flow of a photopolymer onto the surface of the cover film and said vertical plate doctors said photopolymer to uniform thickness before the application of a backing sheet onto the surface thereof;

a shim means connected to said flat plate, said press roll riding on said shim, the height of said press roll from said flat plate being determined by the thickness of said shim means; and

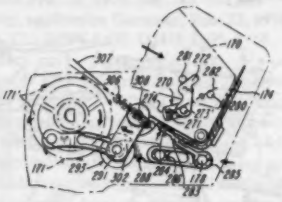
gear means connected to said press roll and said flat plate, said gear means pivotally mounted to said carriage and being thereby vertically adjustable to compensate for the height of said press roll from said flat plate, said gear means driving said carriage.

4,056,424
APPARATUS FOR PRINTING AND APPLYING PRESSURE SENSITIVE LABELS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 476,744, June 5, 1974, Pat. No. 3,957,562, which is a continuation-in-part of Ser. No. 380,445, July 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,245, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Feb. 17, 1976, Ser. No. 658,432
Int. Cl.² B32B *31/00*
U.S. Cl. 156—384 **9 Claims**

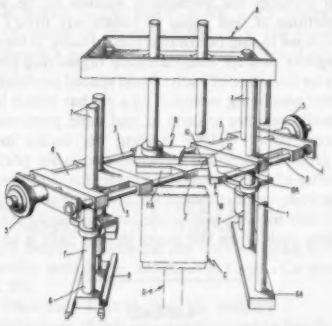
1. Apparatus for applying labels releasably adhered by pressure sensitive adhesive to a web of supporting material, comprising: a frame, means for supporting a roll of pressure sensitive material, a delaminator mounted by the frame, an applicator for applying the delaminated labels, means in contact with the web downstream of the delaminator for feeding the web to the delaminator, brake means including movable means for applying a braking force to the web upstream of the delaminator, means for actuating the movable means, means for driving the web feeding means, the actuating means comprising a pair of spaced-apart abutments, and one of the abutments being effective to move the movable means to the effective braking position and the other of the abutments being effective to move the movable means to the ineffective position.



4,056,425
APPARATUS FOR WELDING TOGETHER A COVER AND A VESSEL OF THERMOPLASTIC MATERIAL

Chester Groby, Nol, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Aug. 12, 1976, Ser. No. 713,899
Claims priority, application Sweden, Aug. 15, 1975, 75/09150
Int. Cl.² B32B *31/04*
U.S. Cl. 156—499 **5 Claims**



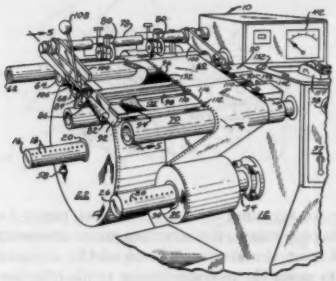
1. Apparatus for welding together a cover and a vessel of thermoplastic material, said apparatus comprising a pair of heating cheeks adapted to be disposed between the cover and the vessel to heat edges thereof to be joined, said heating cheeks being mounted for movement in separate directions from between the cover and the vessel without passing across the opening of the vessel, each heating cheek comprising a pair of arms disposed in mutually angled relationship; the end of an arm of one heating cheek being applied against the inner side of an arm of the other heating cheek.

4,056,426

PAPER SALVAGING MACHINE WITH IMPROVED SPLICING BOARD

Richard F. Sipin, Naperville, Ill., assignor to American Tara Corporation, Chicago, Ill.

Filed Apr. 4, 1977, Ser. No. 784,421
Int. Cl.[2] B31F *5/00*
U.S. Cl. 156—505 **11 Claims**



1. A machine for salvaging the usable portions of a roll of paper which has edge positioned pin-feed registration holes from a continuous supply roll of said paper containing both usable and unusable portions, said machine comprising a frame; first support shaft means mounted for rotation in said frame for supporting the core of said supply roll; second support shaft means mounted for rotation in said frame for supporting a take-up core about which the usable portions of said supply roll are to be wound; a pair of paper engaging guide rollers mounted in said frame with their axes spaced apart sufficiently so as to provide an extended straight line path for paper passing over their surfaces which is being unwound from one of said cores onto the other; splicing board means mounted on said frame and extending outwardly from said frame and normally just under said straight line path; said splicing board means including a pair of elongated spaced apart flat vacuum table portions which are positioned intermediate said pair of guide rollers; a source of vacuum; said table portions being selectively connected to said source of vacuum and having perforated top surfaces for permitting suction to be applied to spaced portions of said paper to selectively firmly affix said spaced portions to said perforated top surfaces; at least a pair of spaced register pins for longitudinally registering the registration holes on one edge of each of said spaced portions of paper, said register pins being mounted on a pin bar which is movable longitudinally relative to each of said table portions to adjust for different paper widths; splicing bar means including a splicing groove positioned between said table portions, said groove being adapted to receive a cutter for cutting said paper; and retractable support means for said pin bar and guide pins for selectively moving said guide pins upwardly through said straight line path when the paper in said path is to be cut or spliced.

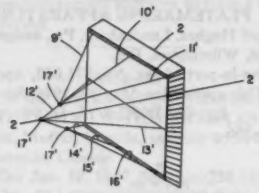
4,056,427

FOCUS COLLIMATOR PRESS FOR A COLLIMATOR FOR GAMMA RAY CAMERAS

Richard N. York, and David L. York, both of Lockport, Ill., assignors to Precise Corporation, Lockport, Ill.

Division of Ser. No. 608,071, Aug. 27, 1975, abandoned. This application July 14, 1976, Ser. No. 705,046
Int. Cl.[2] B23K *27/00*
U.S. Cl. 156—580 **2 Claims**

1. A focus collimator press, including a work table surface lying in a first plane to receive strips thereon for stacking to form a collimator, a press member spaced from said work table surface movable between an engaged pressing position and a retracted position, said press member including face means for engaging and bearing against each last strip added to said collimator stack, angular directing means to angularly direct said face means in a plane which intersects said first plane a constant fixed distance from said face means when said face



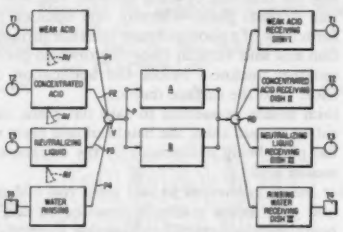
means is in bearing engagement against any one of said last strips added to said stack, said constant fixed distance being substantially equal to the distance of the focal point of the row of apertures formed by each strip added to said stack from the midpoint of such strip.

4,056,428

PROCESS FOR ETCHING INNER SURFACE OF PIPE OR TUBE

Nobuhiko Harada; Minetaka Tanaka; Masanao Shimano; Kyozo Fujinaga; Kunito Nunomura; Masamitu Tamura; Shigeharu Nakamura, and Kazuo Akagi, all of Shimonoseki, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Oct. 6, 1975, Ser. No. 620,230
Claims priority, application Japan, Oct. 5, 1974, 49-114874
Int. Cl.[2] C23F *1/00*
U.S. Cl. 156—642 **6 Claims**



1. A process for etching the inner surface of a pipe or tube by using a plurality of treating solutions, comprising the steps of:

connecting one end of said pipe or tube to an outlet of a treating solution supply means, in a solution-tight sealing manner, having switching means therein for switching and providing a respective treating solution;

supplying and switching said respective treating solutions including a weak acid solution and a concentrated acid solution in turn so as to conduct each treating solution through the pipe or tube for a predetermined period of time;

independently receiving said respective treating solutions flowing out of the other end of the pipe or tube; and

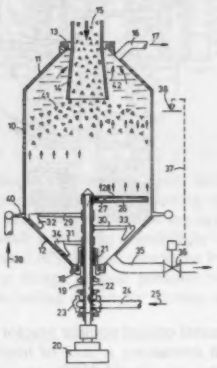
supplying air into said pipe or tube, upon completion of the respective supply of said treating solutions, for discharging residual portions of said treating solutions disposed within said pipe or tube.

4,056,429

METHOD FOR COUNTER-CURRENT TREATMENT OF CELLULOSE FIBER MATERIAL

Johan C. F. C. Richter, St. Jean Cap Ferrat, France; Per Tyke Christenson, and Ole Johan Richter, both of Karlstad, Sweden, assignors to Kamyr Aktiebolag, Karlstad, Sweden

Continuation of Ser. No. 423,812, Dec. 11, 1973, abandoned.
This application July 20, 1976, Ser. No. 707,070
Claims priority, application Sweden, Dec. 11, 1972, 16090/72
Int. Cl.[2] D21C *3/24*
U.S. Cl. 162—17 4 Claims



1. A method of counter-current treatment of cellulosic fiber material in a vessel substantially filled with liquid, said vessel having lower and upper ends, comprising the steps of:

a. introducing fiber material in a substantially continuous flow into the liquid in said vessel through an inlet having an open lower end, said inlet being located centrally in said vessel at the upper end thereof and vertically extending downwardly into said vessel,

b. establishing a fiber material column upper level at a point below the position of said inlet lower end;

c. discharging fiber material through an outlet in the lower end of the vessel at a given rate so that the level of said material column is maintained substantially constant, individual fiber material particles gradually sinking downwardly from the top of said column to said outlet;

d. introducing treatment liquid into said vessel with an upwardly directed velocity component so that said treatment liquid flows upwardly through said material column toward the upper end of said vessel;

e. the velocity of the upflowing treatment liquid being correlated with the dimensions of the inlet relative to the vessel dimensions so that fiber material in said column will not flow upwardly with said upflowing liquid to said liquid outlet; and

f. discharging treatment liquid, as well as displaced liquid introduced with said fiber material entrained by the upwardly flowing treatment liquid, through an unscreened outlet at the upper end of said vessel at a point above the lower end of said inlet;

g. whereby separation of treatment liquid and material takes place without the use of strainers.

4,056,430

PROCESS OF PREVENTING FORMATION OF RESINOUS DEPOSITS IN THE MANUFACTURE OF PAPER AND THE LIKE, AND COMPOSITIONS

Ernst Hoeger, Neuhofen, and Franz Baskovic, Goennheim, both of Germany, assignors to Benckiser-Knapsack GmbH, Ladenburg am Neckar, Germany

Filed Feb. 21, 1975, Ser. No. 551,685
Claims priority, application Germany, Feb. 22, 1974, 2408523
Int. Cl.[2] D21C *9/00*; D21H *3/08, 3/68*
U.S. Cl. 162—76 22 Claims

1. In a process of preventing formation of resinous deposits and overcoming pitch trouble from a resin-containing cellulosic starting material in the manufacture of paper, cardboard, boxboard and the like, said process comprising adding to the resin-containing cellulosic starting material during processing a water-soluble additive consisting essentially of a phosphonic acid compound selected from an alkylene amino phosphonic acid or an alkali metal or ammonium salt thereof in an amount between about 0.02 and about 1.0%, calculated for dry cellulosic material.

4,056,431

RESIN-CONTAINING CELLULOSIC OVERLAYS

John F. Miller, Tacoma, and Rodney R. Conner, Bellevue, both of Wash., assignors to Pacific Resins & Chemicals, Inc., Tacoma, Wash.

Filed June 7, 1976, Ser. No. 693,559
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—165 19 Claims

1. In a process for producing a resin-containing cellulosic overlay useful for overlaying woody substrates comprising admixing an aqueous slurry of cellulosic fibers and an alkaline, water-solubilized resin, precipitating the resin onto said fibers by acidification of said slurry and forming a dry sheet from the acidified slurry, the improvement wherein said resin is a resole resin produced by reacting bisphenol A, from 0.35 to 1.35 moles per mole of bisphenol A of a para-substituted phenol selected from p-tertiarybutylphenol, p-tertiaryamylphenol and p-phenylphenol and an amount of formaldehyde satisfying the equations $F \geqq 0.3(4X + 2Y)$ and $F \leqq 4X + 2Y$ wherein F is the number of moles of formaldehyde, X is the number of moles of bisphenol A and Y is the number of moles of para-substituted phenol.

4,056,432

PROCESS FOR MAKING PAPER PRODUCTS OF IMPROVED DRY STRENGTH

Robert Clayton Slagel, Pittsburgh, and Gloria DiMarco Sinkovitz, Bridgeville, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed July 6, 1971, Ser. No. 160,097
The portion of the term of this patent subsequent to Jan. 9, 1990, has been disclaimed.
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—168 NA 1 Claim

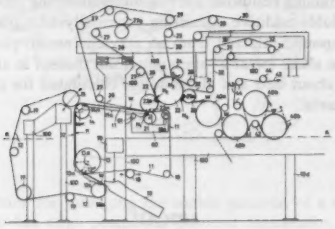
1. An improved process for making paper having dry strength comprising forming an aqueous suspension of papermaking cellulosic fibers, adding to said suspension a dry strength additive, sheeting the fibers to form a web and heating the web until dry to form the paper, wherein the improvement comprises using as the dry strength additive, a graft copolymer comprising from 5 to 99.5 percent by weight of a chitosan substrate and the remainder derived from acrylamide monomer.

4,056,433

ASCENDING TWIN-WIRE PAPER MACHINE WITHOUT WEB PICK-UP

Martti Koponen, and Pertti Soikkanen, both of Jyvaskyla, Finland, assignors to Valmet Oy, Finland

Filed Sept. 15, 1976, Ser. No. 723,224
Claims priority, application Finland, Sept. 16, 1975, 752585
Int. Cl.[2] D21F 9/00
U.S. Cl. 162—290 11 Claims



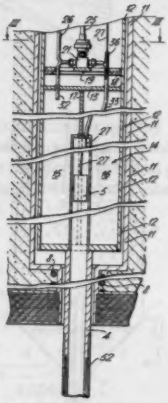
1. In a paper machine, a pair of endless fabric means and forming roll means cooperating therewith for providing with said pair of endless fabric means an ascending twin-wire former and in advance of said twin-wire former a single-wire former, one of said endless fabric means having an upper run extending laterally from said twin-wire former and carrying the web formed at said twin-wire former beyond the latter on an upper surface of said upper run of said one fabric means, a pair of press rolls including a lower press roll and an upper press roll for defining between themselves a first press nip, said upper run of said one fabric means passing between said press rolls and an endless felt also passing between said press rolls and being lapped around said upper press roll so that said endless felt and said one fabric means are sandwiched between said press rolls and the web travelling beyond said first nip together with said endless felt around part of said upper press roll, and a rotary cylinder defining with said upper press roll at least a second press nip where said endless felt travels together with the web between said upper press roll and said rotary cylinder, whereby the web is fully supported along a closed conduction path from said twin-wire former through said first and second press nips, the latter forming part of a press section to which the web is delivered without requiring a pick-up roll or felt, said forming roll means including an upper couch roll lapped in part by said one endless fabric means and from which said upper run of said one endless fabric means extends laterally from said twin-wire former, said couch roll including a suction means for detaching the web from the other of said pair of endless fabric means and causing the web to travel with said one endless fabric means beyond said twin-wire former at the upper surface of said upper run of said one endless fabric means, and said forming roll means also including a lower forming roll, said pair of endless fabric means travelling together from said lower forming roll to said upper couch roll while pressing against the web situated between said pair of endless fabric means while they travel upwardly from said lower forming roll to said upper couch roll, so as to form said ascending twin-wire former.

4,056,434

LIQUID METAL COOLED NUCLEAR REACTOR SCANNING APPARATUS

Sidney Barnes, Warrington, and John Roderick Fothergill, Lymm, both of England, assignors to United Kingdom Atomic Energy Authority, United Kingdom

Filed Nov. 13, 1975, Ser. No. 631,650
Claims priority, application United Kingdom, Dec. 12, 1974, 53863/74
Int. Cl.[2] G21C 17/02
U.S. Cl. 176—19 R 5 Claims



1. A liquid metal cooled nuclear reactor construction comprising: a vault containing a pool of liquid metal coolant; a vertical dip tube extending into the pool of coolant; a transducer unit for generating ultra-sound signals housed within the dip tube and disposed above the pool of coolant; a vacuum source connectable to an upper closed end of the dip tube for drawing a column of liquid metal from the pool into the dip tube; first and second vacuum reservoirs connected in series between the dip tube and the vacuum source; fluid flow isolating valves disposed one each between the dip tube and the first vacuum reservoir, between the first and second vacuum reservoirs and between the second vacuum reservoir and the vacuum source; and means for cooling the upper region of the column of liquid metal between two lifting stages and before submersion of the transducer in liquid metal.

4,056,435

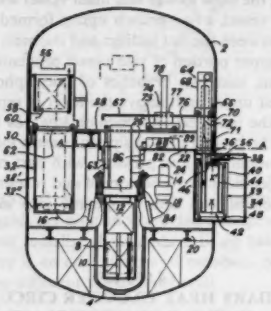
LOADING AND UNLOADING OF A NUCLEAR REACTOR CORE

Jacques Carlier, Aix-en-Provence, and Bernard Risbourg, St. Paul-lez-Durance, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 7, 1975, Ser. No. 593,443
Claims priority, application France, July 11, 1974, 74.24158
Int. Cl.[2] G21C 19/06, 19/10
U.S. Cl. 176—30 6 Claims

1. A nuclear reactor of the water-cooled type, comprising an outer containment vessel, a pressure vessel in the lower portion of said outer vessel, a top flange and a top closure cap for said pressure vessel and containing a reactor core, a plurality of vertical fuel assemblies for said core, upper internal structures above said core and said pressure vessel, a structure having a horizontal bottom wall serving as a pool, a first orifice in said bottom wall located above said pressure vessel and having a diameter slightly larger than that of said closure cap, a second orifice in said bottom wall in communication between said structure and a leak-tight storage compartment partially within said outer containment vessel and partially exterior to said outer containment vessel and at a lower level than said structure, closure means for said second orifice, said compartment

receiving containers for the storage of fuel assemblies, means for moving said containers from a position beneath said second orifice to a position beneath a third orifice in said storage compartment opening to the exterior of said outer containment vessel, said third orifice providing for discharge of containers through it, a storage zone for said pressure vessel closure cap, first means for lifting said pressure vessel closure cap and for



transferring said cap to said storage zone, second means for lifting the fuel assemblies and transferring said assemblies directly from said reactor core to said storage compartment and a removable shell providing a leak-tight connection between said bottom wall of said structure at the level of said first orifice and said top flange of said pressure vessel said first means for lifting including means for storing said removable shell.

4,056,436

SYSTEM FOR MITIGATING THE EFFECTS OF AN ACCIDENT AT A NUCLEAR POWER PLANT

Anatoly Matveevich Bukrinsky, prospekt Vernadskogo, 119, kv. 19; Genrikh Vladimirovich Matskevich, Sevanskaya ulitsa, 7, kv. 66; Julian Vulfovich Rzheznikov, Michurinsky prospekt, 16, kv. 35; Andrei Borisovich Sukhov, ulitsa Krupskoi, 15, kv. 75; Viktor Petrovich Tatarnikov, ulitsa Chusovskaya, 11, korpus 8, kv. 24; Viktor Mozesovich Berkovich, Sakhalinskaya ulitsa, 6, korpus 1, kv. 156, all of Moscow; Jury Nikolaevich Remzhin, ulitsa Vasi Alexeeva, 24, kv. 20, Leningrad; Lev Nikolaevich Slepnev, Novocherkassky prospekt, 18, kv. 221, Leningrad; Alexandr Anatolievich Sverdlov, ulitsa Zhelyabova, 1, kv. 69, Leningrad; Vladimir Geselevich Karan, ulitsa Uralskaya, 46, kv. 97, Sverdlovsk; Jury Petrovich Kaloshin, Verkhne-Pervomaiskaya ulitsa, 14, kv. 17, Moscow; Anatoly Nikolaevich Krasikov, Inzhenernaya ulitsa, 32, kv. 42; Evgeny Akimovich Babenko, Inzhenernaya ulitsa, 32, kv. 12, both of Sverdlovsk; Vladimir Konstantinovich Bronnikov, ulitsa Pobedy, 102, kv. 2, Gorlovka Donetskoi oblasti; Jury Vasilievich Shvyryaev, Dnepropetrovskaya ulitsa, 23, korpus 3, kv. 117, Moscow, and Boris Semenovich Shiryaev, Inzhenernaya ulitsa, 34, kv. 3, Sverdlovsk, all of U.S.S.R.

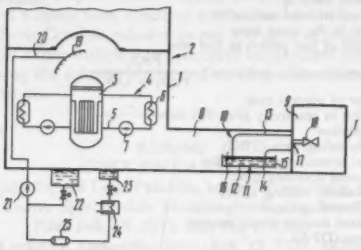
Filed June 4, 1975, Ser. No. 584,011

Claims priority, application U.S.S.R., June 5, 1974, 2026554

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—38 **5 Claims**

1. A system for mitigating the effects of an accident at a nuclear power plant, comprising: a first container accommodating a nuclear reactor and its primary cooling system, wherein an unusually high pressure rise can occur as a result of vaporization caused by ebullition of the leaking coolant, the resulting vapor mingling with air to form a vapor-air mixture; a second container arranged separately from said first container and communicating therewith to receive and contain air partially forced out from said first container as the pressure therein rises and the vapor-air mixture is formed; a conduit between the first and second containers, through which the interiors of said containers communicate and said vapor-air mixture passes from said first container into the second container as a result of said pressure rise; a passive vapor condenser placed in said conduit across the flow of said vapor-air mixture, said condenser being substantially a bubbling device comprising a trough filled with a coolant and a housing arranged above said trough with an inlet portion of said housing being lowered into said trough so that formed between the walls of said trough and the inlet portion of said housing are passages wherethrough said vapor-air mixture is introduced into the trough under the pressure rise in the first container, the vapor being condensed in the trough as said mixture passes through said coolant, the air filling the inner space of said housing in which a pressure rise occurs, the housing having an outlet portion connected to the inlet of said second container; a non-return valve mounted at the inlet to said second container and controlling air flow from said housing to said second



container, whereby the latter can be cut off from said first container and the air is prevented from returning thereto, said valve being opened when the pressure of the air accumulated in said housing rises and exceeds the pressure in said second container for passing the air into said second container, while closure of the valve takes place when the pressures in said housing and second container become equal; and a supplementary condenser of the sprinkler type, disposed in said first container and actuated upon leakage of said coolant, said condenser condensing the vapor filling said first container after air has been forced out therefrom into said second container, whereafter a negative pressure develops in said first container, precluding release of radioactive products to the environment, the operation of said condenser of the sprinkler type being completed when all of the vapor resulting from the accident has been condensed.

4,056,437

FAST REACTOR CORE

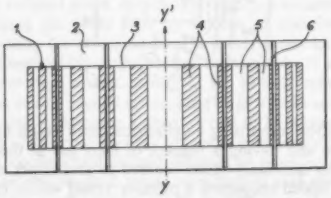
Christian Giacometti; Jean-Claude Mougniot, both of Manosque, and Jean Ravier, Venelles, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sept. 24, 1975, Ser. No. 616,132

Claims priority, application France, Sept. 30, 1974, 74.32882

Int. Cl.[2] G21C *1/02*

U.S. Cl. 176—40 **1 Claim**



1. A fast reactor core comprising:

an inner zone of a single enrichment having a heterogeneous structure with a vertical axis about which is arranged a

distribution of fissile material and fertile material alternating in a radial direction from said vertical axis, said distribution and enrichment providing an internal breeding gain within said inner zone that at most results in a total reactivity change that is slightly positive; and

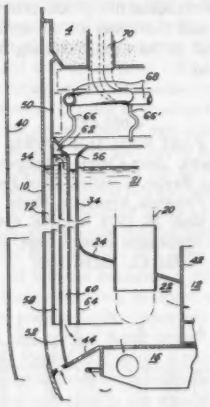
an outer zone of fertile material surrounding said inner zone, said core having the following characteristics:

Volumetric percentage - fuel (fissile material) :	
steel (cladding and structure)	22.3 %
sodium (coolant)	40.6 %
fuel ($UO_2 + PuO_2$)	32.9 %
Volumetric percentage (fertile material) :	
steel	19.2 %
sodium	27.8 %
fertile material	50.5 %
Height of fuel	100 cm
Linear power in fuel	500 W/cm
Maximum burn-up	115,000 MWd/T
Thickness of axial and radial blankets in the outer zone	50 cm
Diameter of fuel pellets in fuel pins	5.5 mm
Concentration of enrichment ($\frac{PuO_2}{PuO_2 + UO_2}$)	33.5 %
Number of control rods	12
Variation in reactivity after 308 days of irradiation	+ 250 pcm
Total breeding gain (TBG)	0.47
Internal breeding gain (IGB)g	0.031
Compound doubling time	12 years
Core sodium voiding effect	+ 700 pcm
Total flattening factor	1.42
Integrated dose in displacements per atom (DPA)	70

4,056,438
LIQUID SODIUM COOLED FAST REACTOR

Jean-Michel Gama, Ormesson; Jean Lallement, Verrieres-le-Buisson, and Lucien Pugnet, Boulogne, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 513,817, Oct. 10, 1974, abandoned.
This application July 15, 1976, Ser. No. 705,693
Claims priority, application France, Oct. 18, 1973, 73.37232
Int. Cl.[2] G21C *15/12*
U.S. Cl. 176—50 **7 Claims**

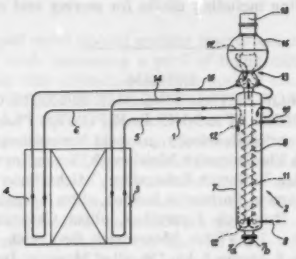


1. A reactor comprising a cylindrical main vessel having an upper edge and having a blanket of inert gas at the top, an end-wall for said main vessel secured to said upper edge and forming a sealed enclosure, a primary vessel within each said main vessel, a reactor core within said primary vessel, fuel assemblies is said core, a support structure for said fuel assemblies, a liquid sodium coolant for said core which flows upwards through said fuel assemblies of said reactor core and exiting said core as hot metal coolant, primary heat exchangers in said primary vessel receiving said hot coolant from said core, cold liquid sodium exiting from said heat exchangers into a bottom zone of said main reactor vessel or intervessel zone, a primary vessel separating said zone from the remainder of said vessel, pumps within said primary vessel for withdrawing said cold sodium from said zone and for reinjecting said cold sodium under pressure into the lower portion of said reactor core fuel assemblies, and at least one assembly of cylindrical shells having the same axis as said main vessel and surrounding said primary vessel, a two-branch siphon formed by said shells interposed between the hot sodium and the main vessel wall in at least the upper portion of said vessel preventing stagnation of the sodium, said two branches of said siphon being connected at their upper ends above the level of separation of the sodium and the inert gas and opening towards the bottom of the reactor, the branch of said siphon nearest said main vessel wall being supplied at low pressure with part of the cold sodium only injected into the bottom of said reactor core and the second branch of said siphon opening into said intervessel zone.

4,056,439
SECONDARY HEAT TRANSFER CIRCUITS FOR NUCLEAR REACTOR PLANT

Marcel Robin, Sevres, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 16, 1976, Ser. No. 714,374
Claims priority, application France, Aug. 22, 1975, 75.26039
Int. Cl.[2] G21C *15/02*
U.S. Cl. 176—65 **7 Claims**



1. In a secondary heat transfer circuit of a nuclear reactor, which circuit comprises at least one steam generator module, at least one intermediate heat exchanger, pipe means interconnecting the steam generator module and the heat exchanger for circulation of a heat transfer liquid between the heat exchanger and the steam generator module, and pump means for effecting said circulation:

the improvement wherein the steam generator module includes a central return duct central to the pump means mounted on the steam generator module for cold heat transfer liquid from the generator and the pump means includes an intake directly connected to said central duct, the steam generator module including at its lower end a rapid drainage pipe system obturated from the steam generator module by a safety membrane.

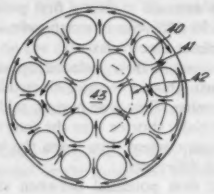
4,056,440
HEAT TRANSFER CHANNELS

Robert Victor Macbeth, Bournemouth, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed May 28, 1975, Ser. No. 581,431
Claims priority, application United Kingdom, June 3, 1974, 24424/74
Int. Cl.[2] G21C *3/30*
U.S. Cl. 176—78 **9 Claims**

1. A heat transfer channel comprising a channel wall, an inlet for a heat receiving liquid coolant at one end, an outlet for

a two phase liquid/vapour mixture at the other, a plurality of elongated, heat emitting members supported in the channel by axially spaced grids in at least two annular concentric rows between the inlet and the outlet in spaced apart relation to one another and to the channel wall and extending parallel to one



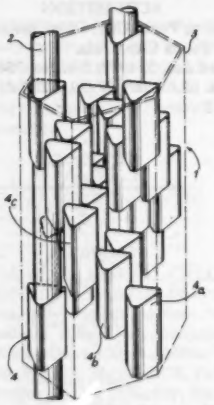
another and to the channel axis, the heat emitting members between the grids defining unobstructed passageways for coolant axially and radially, the members being held in position such that there is an odd number of members occupying the outermost row adjacent the channel wall.

4,056,441

BRACING DEVICE FOR A BUNDLE OF PARALLEL PINS IN A NUCLEAR REACTOR ASSEMBLY

Pierre Marmonier, Aix-en-Provence, France; Bernard Mesnage, Madras, India; Jean Skok, Aix-en-Provence, France, and Jean Vayra, Meyreuil, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 19, 1976, Ser. No. 650,031
Claims priority, application France, Jan. 20, 1975, 75.01655
Int. Cl.² G21C *3/34*
U.S. Cl. 176—78 **9 Claims**



1. A bracing device for a bundle of parallel pins in nuclear reactor assembly, comprising at least one compartment grid formed by multisided cylinder elements of small height placed in juxtaposed relation and each traversed axially by one pin of the bundle, said elements being rigidly fixed to each other at successive points in the grid, wherein said elements are displaced along the height of said pins so as to be distributed in at least one helix.

4,056,442

LIPASE COMPOSITION FOR GLYCEROL ESTER DETERMINATION

Charles Y. Huang, S. Pasadena, Calif., and Alejo V. Roy, Carmel, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 1, 1976, Ser. No. 691,932
Int. Cl.² C07G *7/02*; G01N *31/14*
U.S. Cl. 195—62 **13 Claims**

1. A composition useful for the hydrolysis of a glycerol ester in an aqueous medium comprising a mixture of from 15 to 95 units of *Rhizopus arrhizus* lipase and from 5 to 85 units of *Candida cylindracea* lipase per 100 units of total lipase present.

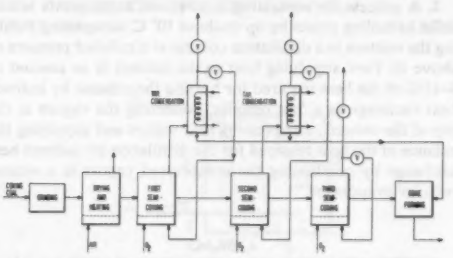
8. A method for hydrolyzing a glycerol ester and for determining the amount of glycerol ester present in an aqueous medium which comprises incubating the glycerol ester at a pH of 5.5–9.0 with a lipase mixture having the proportions of 15 to 95 units of a lipase from *Rhizopus arrhizus* and 5 to 85 units of a lipase from *Candida cylindracea* per 100 units of total lipase present for a time sufficient to hydrolyze the glycerol ester and determining the amount of glycerol or fatty acids released by the hydrolysis.

4,056,443

COKE PRODUCTION

Angelo Colletta, and Luigi Palumbo, both of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Feb. 19, 1976, Ser. No. 659,580
Claims priority, application Italy, Feb. 19, 1975, 48246/75
Int. Cl.² C10B *47/24, 49/10, 53/04, 57/04*
U.S. Cl. 201—5 **2 Claims**



1. A method of producing coke of low sulfur content, comprising grinding coking coal, drying and heating the ground coal at a temperature of 200° to 300° C. for 15 to 120 minutes by fluidizing the ground coal with gas thereby to produce a dried and heated material; passing said material to a first semicoking stage, heating said material by fluidization in said first semicoking stage at 300° to 470° C. for 10 to 20 minutes while supplying to said first semicoking stage a make-up fluidizing gas containing oxygen in a quantity of 10 to 30 normal liters per kilogram of dry coal, thereby to produce semicoke and first offgases; cooling said first offgases to produce condensed tar and first residual gases; recycling to said first semicoking stage as fluidizing gas 60 to 80% by volume of said first residual gases; passing the semicoke from said first semicoking stage to a second semicoking stage, heating the semicoke in said second semicoking stage at 400° to 600° C. for 10 to 20 minutes while supplying to said second semicoking stage a make-up fluidizing gas containing oxygen in a quantity of 5 to 20 normal liters per kilogram of dry coal, thereby to produce semicoke and second offgases; cooling said second offgases to produce condensed tar and second residual gases; recycling to said second semicoking stage as fluidizing gas 60 to 80% by volume of said second residual gases; passing the semicoke from said second semicoking stage to a third semicoking stage, heating the semicoke by fluidization in said third semicoking stage at 800° to 1100° C. for 10 to 20 minutes with the production of third offgases while supplying to said third semicoking stage a make-

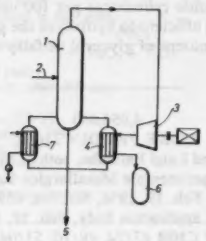
up fluidizing gas containing oxygen in a quantity of 40 to 100 normal liters per kilogram of dry coal; recycling to said third semicoking stage as fluidizing gas 10 to 20% by volume of said third offgases; and briquetting the semicoke from said third semicoking stage into formed coke.

4,056,444

VACUUM SEPARATION OF MIXTURES WITH SIMILAR BOILING POINTS

Bodo Weicht, and Karl Kleinhenz, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 2, 1975, Ser. No. 564,395
Claims priority, application Germany, Apr. 24, 1974, 2419723
Int. Cl.[2] B01D *3/10*
U.S. Cl. 203—26 **9 Claims**



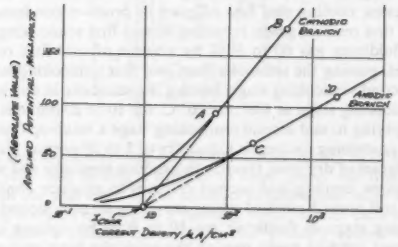
1. A process for separating mixtures of components which differ in boiling points by up to about 10° C, comprising distilling the mixture in a distillation column at a reduced pressure of above 10 Torr, supplying heat to the column in an amount of 5–15% of the heat required for heating the column by indirect heat exchange in a first reboiler, collecting the vapors at the top of the column, compressing said vapors and supplying the balance of the heat required for the distillation by indirect heat exchange by condensing the compressed vapors in a second reboiler evaporator.

4,056,445

DETERMINATION OF CORROSION RATES BY AN ELECTROCHEMICAL METHOD

Wayne M. Gauntt, 1825 Wheaton Ave., Claremont, Calif. 91711, and Earl L. Pye, 2910 Santez Drive, Pomona, Calif. 91768

Continuation-in-part of Ser. No. 621,550, Oct. 10, 1975, abandoned, and a continuation-in-part of Ser. No. 538,763, Jan. 6, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 744,972
Int. Cl.[2] G01N *27/46, 27/30*
U.S. Cl. 204—1 T **20 Claims**



1. A method for determining the freely corroding current density of a metallic substance immersed in an electrolyte, comprising the steps of:

providing a working electrode formed of said substance,

providing a counter electrode formed of a conductive material,

providing a reference electrode formed of a conductive substance,

immersing said three electrodes in said electrolyte,

establishing by external means a first potential difference, not less than **50** millivolts in magnitude, across said working and reference electrodes,

measuring the current flow induced by said first potential difference through said counter electrode after the elapse of a predetermined first time period, said first time period being substantially shorter than the time required to establish equilibrium current flow upon the imposition of said first potential difference,

measuring said first potential between said working and reference electrodes,

recording said current and said potential difference,

establishing by said external means a second potential difference, substantially higher in magnitude than said first potential difference, between said working and reference electrodes,

recording said second potential difference and the current resulting therefrom after the elapse of a second pre-determined time period, said second time period being substantially shorter than the time required to establish equilibrium current flow upon the imposition of said second potential difference,

converting said current measurements into current density measurements,

deriving the linear equation passing through the pair of coordinate points represented by the measured first and second potential differences and by the logarithms of the corresponding measured current densities, and

determining, by means of said equation, the freely corroding current density at zero applied potential difference.

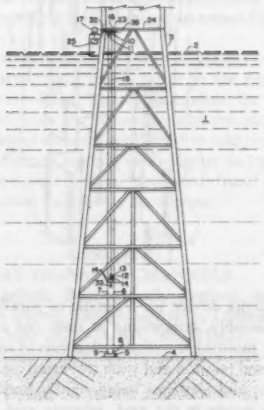
2. The method of claim **1** wherein said first potential difference is selected in the range between 50 and 200 millivolts and said second potential difference is selected in the range between 100 and 400 millivolts.

4,056,446

DIVERLESS CATHODIC PROTECTION DATA ACQUISITION

Richard M. Vennett, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 3, 1977, Ser. No. 756,571
Int. Cl.[2] G01N *27/30*; C23F *13/00*
U.S. Cl. 204—1 T **12 Claims**



1. In a process for diverless acquisition of data useful for determining cathodic protection of a portion of a structure

immersed in salt-containing water and subject to corrosion wherein the structure extends from contact with the bottom of the body of water to above the surface of the body of water and wherein the process comprises:

a. passing a reference electrode along a guide line to a definite point along the length of the guideline wherein the guideline is fastened on one end to the structure above the surface and on the other end to an anchoring means near the bottom such that the guideline passes in proximity to the portion of the structure to be sensed for protection, wherein the electrode is slideably mounted on the guideline, and

b. recovering electrode potential data from the electrode at the definite point on the guideline; the improvement comprising:

c. maintaining the guideline taut and maintaining the electrode at a fixed distance from the guideline and in a fixed radial direction from the guideline.

9. An apparatus for diverless acquisition of data useful for determining cathodic protection of a portion of a structure immersed in salt-containing water and subject to corrosion wherein the structure extends from contact with the bottom of the body of water to above the surface of the body of water comprising in combination with said partially immersed structure:

(a). an anchoring means near the bottom,

(b). a first taut guideline contacting the anchoring means on one end and the other end contacting the member of the structure above a surface of the water,

(c). a second taut guideline contacting the anchoring means and contacting the member of the structure above the surface such that the second taut guideline is parallel to the first taut guideline and such that both guidelines pass within proximity of the portion of the structure subject to corrosion,

(d). a saddle slideably attached to the first guideline and the second guideline,

(e). a reference electrode mounted in association with the saddle such that its radial direction and distance from the first guideline remains constant,

(f). a readout attached in electrical communication to the electrode,

(g). a line for raising and lowering the electrode and the saddle assembly on the guidelines attached on one end to the electrode and saddle assembly, and

(h). means for determining the depth to which the line is played out and consequently the position of the electrode and saddle assembly.

4,056,447

ELECTROLYZING ALKALI METAL CHLORIDES USING RESIN BONDED ASBESTOS DIAPHRAGM

Luigi Giuffre, Milan, Italy; Vittorio De Nora, Nassau, Bahamas, and Placido Spaziante, Milan, Italy, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 575,415, May 7, 1975, Pat. No. 4,020,235. This application Dec. 6, 1976, Ser. No. 747,708

Claims priority, application Italy, Mar. 6, 1975, 20989

Int. Cl.[2] C25B *1/16, 1/26, 13/06, 13/00*

U.S. Cl. 204—98 **17 Claims**

1. In a method of electrolyzing alkali metal chlorides in an electrodic gap between an anode and a cathode provided with a diaphragm, the improvement comprising the diaphragm being made of a composition comprising an inert fibrous material impregnated with a copolymer of styrene and divinyl benzene copolymerized directly on the material in the absence of a solvent and there sulfonated and halogenated.

4,056,448

PROCESS FOR BRINE MEMBRANE CELL OPERATION WITH EXTERNAL CAUSTIC AND NaCl CONCENTRATION CONTROL

Andrew D. Babinsky, Chagrin Falls, Ohio, and Ronald L. Dotson, Cleveland, Tenn., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Dec. 17, 1976, Ser. No. 751,644

Int. Cl.[2] C25B *1/16, 1/00*

U.S. Cl. 204—98 **3 Claims**

1. In a process for the electrolysis of an aqueous sodium chloride solution in an electrolytic cell the anolyte and catholyte compartments of which are separated by an electrolytically-conductive, hydraulically impervious, cation permselective membrane, having an equivalent weight of approximately 1200, the improvement which consists essentially of establishing and maintaining the sodium hydroxide concentration in the catholyte within the range of about 540 -580 grams per liter by the addition of water from outside the cell and simultaneously establishing and maintaining the sodium chloride concentration in the anolyte within the range of about 170 to 210 grams per liter while maintaining the current density in the range 0.75 to 1.25 amperes per square inch.

4,056,449

ELECTROWINNING METHOD

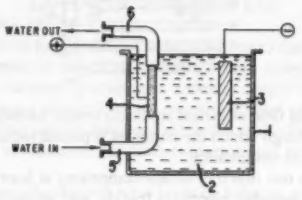
Vittorio de Nora, Nassau, Bahamas; Antonio Nidola, and Giuseppe Bianchi, both of Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Filed Sept. 23, 1975, Ser. No. 616,044

Claims priority, application Italy, Oct. 31, 1974, 29067/74

Int. Cl. C25b *1/04;* **C25C** *1/06, 1/12, 1/16*

U.S. Cl. 204—106 **14 Claims**



1. In a method of evolving oxygen by electrolysis of aqueous solutions by passing an electric current through the solution with oxygen being evolved at the anode, the improvement comprising operating the electrolysis so that the surface temperature of the anode is not greater than 40° C to prevent deposition of an impurity on the anode which increases oxygen overvoltage and causes passivation.

4,056,450

CONTINUOUS DETINNING SYSTEM

George L. McCauslan, Jamesburg, and Donald B. Read, Colts Neck, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

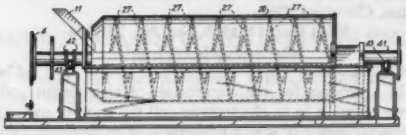
Division of Ser. No. 591,891, June 30, 1975. This application June 16, 1976, Ser. No. 696,642

Int. Cl.[2] C25F *7/00, 5/00*

U.S. Cl. 204—201 **15 Claims**

14. In a plant for the continuous recovery of tin as tin metal from tin plate scrap comprising in a sequence of treatment stages means for storing tin plate scrap, means for conveying said tin plate scrap, chute means for said tin scrap, to a revolving anodic perforated drum having an opening at one end for receiving material, contact means for rendering said drum anodic, a central cylinder inside said drum, drive means for revolving said drum, helical means interposed between said drum and said cylinder, said means dividing the annular zone

between said drum and said cylinder into a plurality of flights, each accommodating a quantity of scrap, said helical means being arranged to advance said scrap from the intake end of said drum to the discharge end thereof, a tank for bath solution



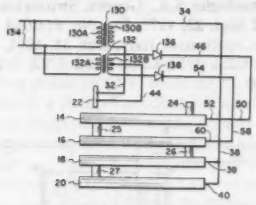
in which said drum is partially submerged, a plurality of cathode plates obversely and externally to said electrically anodic rotating drum arranged in a longitudinal row on the inside wall of said tank containing said bath solution, conveying means for detinned scrap and storage means for said detinned scrap.

4,056,451

DUAL FIELD ELECTRIC TREATER

Robert A. Hodgson, Tulsa, Okla., assignor to Maloney-Crawford Tank Corporation, Tulsa, Okla.

Filed Mar. 29, 1976, Ser. No. 671,090
Int. Cl.[2] C10G *33/02*
U.S. Cl. 204—305 **7 Claims**



1. In an oil field electrical emulsion treater having a plurality of trays through which the emulsion is passed sequentially, the improvement comprising:

a. at least one first tray means comprising at least one insulatively mounted electrode therein, and means to apply an AC potential between said electrode and the walls of said first tray;

b. at least one additional pair of trays, each pair comprising a second tray and a third tray, at least one insulatively mounted electrode in each of said second and third trays, and means to apply unidirectional pulsed half wave rectified potential between said electrodes in said second and third trays and the walls of each respective tray, the half waves in said second tray being out of phase by 180° with the half waves in said third tray.

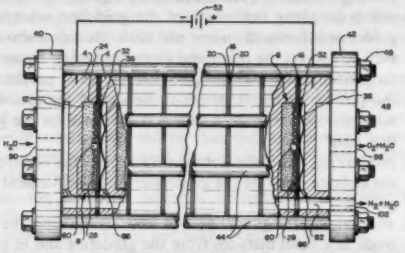
4,056,452

ELECTROLYSIS APPARATUS

Barrie C. Campbell, Provo, Utah, assignor to Billings Energy Research Corporation, Provo, Utah

Filed Feb. 26, 1976, Ser. No. 661,788
Int. Cl.[2] C25B *1/02, 11/02*
U.S. Cl. 204—258 **21 Claims**

1. An electrode structure for electrolysis apparatus having a solid polymer electrolyte membrane and a pair of electrodes disposed on either side of and in contact with the membrane, at least one of said electrodes including a corrugated surface portion which presents alternating ridges and grooves, with the ridges being maintained in contact with the membrane so that the portions of the membrane in contact with the ridges are deformed to conform in shape to the tops of the ridges and the grooved bottoms being spaced from the membrane to enable the flow of fluid through the grooves, said corrugated



surface portion extending over a generally circular area and in a substantially flat plane.

4,056,453

UV-CURING PRINTING INKS

Helmut Barzynski, Bad Durkheim; Günter Heil, Ludwigshafen; Karl Klemm, Stuttgart, and Helfrid Sander, Beihingen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 527,269, Nov. 26, 1974, abandoned.
This application July 29, 1976, Ser. No. 709,802
Claims priority, application Germany, Nov. 27, 1973, 2358948
Int. Cl.[2] C08F *8/00;* C08G *18/00*
U.S. Cl. 204—159.23 **9 Claims**

1. A printing ink curable by UV radiation and comprising

A. from 0 to 50 percent by weight of a pigment conventionally used in printing inks;

B. from 0.5 to 15 percent by weight of a mixture of benzophenone and Michler's ketone;

C. from 40 to 85 percent by weight of at least one polymerizable olefinically unsaturated compound which has an average molecular weight of from 250 to 4000 and which contains at least one group of the formula:

$$CH_2{=}CR{-}\underset{\underset{O}{\|}}{C}{-}$$

wherein R is a hydrogen atoms or a methyl group and at least one urethane group, which has been manufactured from aliphatic or cycloaliphatic diisocyanates or polyisocyanates and at least one hydroxyl-containing acrylic or methacrylic compound selected from the group consisting of ethylene glycol monoacrylate or monomethacrylate, 1,2- or 1,3-propanediol monoacrylate or monomethacrylate, 1,4-butanediol monoacrylate or monomethacrylate and 1,6-hexanediol monoacrylate or monomethacrylate and

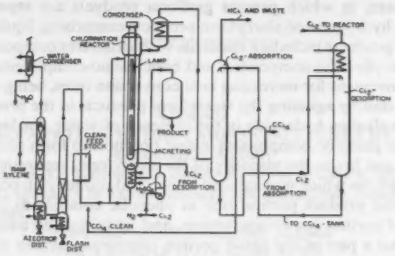
D. From 10 to 25 percent by weight of at least one compound which is liquid at 50° C and which is obtained by reacting a diglycidyl ether of an aliphatic diol, triol or tetrol, containing from 2 to 8 carbon atoms with acrylic acid or methacrylic acid used in an amount of at least one mole per epoxide group in the diglycidyl ether and optionally thereafter esterifying or etherifying the reaction product at the free hydroxyl group or groups thereof; the polymerizable olefinically unsaturated compound (s) (C) and the compound (s) (B) which is liquid at 50° C being such that when in admixture they form a mixture having a vapor pressure of less than 1 mm Hg at 100° C and a viscosity greater than 1 poise at 30° C and containing substantially no fatty oils of fatty acids having more than 6 carbon atoms.

4,056,454

PROCESS FOR THE PREPARATION OF α,α,αα',α'-PENTACHLORO-O-XYLENE

Paul Riegger, Troisdorf; Hermann Richtzenhain, Much-Scwellenbach, and Gunter Zoche, Bonn, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany

Filed Aug. 2, 1976, Ser. No. 710,834
Claims priority, application Germany, Aug. 9, 1975, 2535696
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—163 R 7 Claims



1. Process for the preparation of α,α,α,α',α'-pentachloro-o-xylene consisting essentially of reacting o-xylene with chlorine in the presence of carbon tetrachloride as solvent under actinic light radiation, at temperatures above 75° up to 140° C, the temperature being increased from about above 75° – 90° C at the beginning to about 110 – 140 at the end of the reaction, carbon tetrachloride vapor being evolved during the reaction and the vapor being condensed and recirculated to the reaction, the actinic light radiation source being a high-pressure mercury immersion lamp which is surrounded by a jacket filled with organic liquid which partially absorbs the radiation, the reaction being carried out in the absence of additive which binds traces of metal.

4,056,455

PROCESS FOR THE CONTINUOUS PREPARATION OF MONO- OR DI-(TRICHLOROMETHYL)-BENZENES

Rudolf Lademann, Kelheim, Taunus; Franz Landauer, Frankfurt am Main; Heinrich Lenzmann, Kelheim, Taunus; Klaus Schmiedel, Konigstein, Taunus, and Wolfram Schwiersch, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 1, 1976, Ser. No. 701,819
Claims priority, application Germany, July 5, 1975, 2530094
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—163 R 9 Claims

1. In a process for the continuous preparation of a mono- or di-(trichloromethyl)-benzene, or a mono- or di-(trichloromethyl)-benzene halo-substituted in the benzene ring, from the corresponding unsubstituted or halo-substituted mono- or dimethylbenzene, or said unsubstituted or halo-substituted mono- or dimethylbenzene which is mono- or dihalo-substituted in one or both methyl groups, and chlorine in several steps by irradiating with actinic light, the improvement which comprises reacting said unsubstituted or halo-substituted mono- or dimethylbenzene, or said unsubstituted or halo-substituted mono- or dimethylbenzene which is mono- or dihalo-substituted in one or both methyl groups, in four to 14 steps with chlorine, by introducing chlorine to the second step and the following steps, or to the second and following steps excluding the last step when the quantity of chlorine dissolved in the reaction product amounts to a multiple of the expected conversion, introducing the resulting waste gas to step 1 and reacting the chlorine contained in the waste gas there with fresh said corresponding unsubstituted or halo-substituted mono- or dimethyl benzene, or said unsubstituted or halo-substituted mono- or dimethylbenzene which is mono- or dihalo-substituted in one or both methyl groups.

4,056,456

PROCESS FOR PREPARING NOVEL THIN FILMS

Takezo Sano, Takatsuki, and Masao Sasaki, Ibaragi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 22, 1974, Ser. No. 526,253
Claims priority, application Japan, Nov. 22, 1973, 48-131989
Int. Cl.[2] B01K *1/00*; B01J *1/00*
U.S. Cl. 204—165 14 Claims

1. A process for preparing a novel thin film which comprises crosslinking the surface of a layer of a surfactant selected from the group consisting of fatty acid salts, sulfuric acid esters of higher alcohols, alkylbenzenesulfonates, alkylnaphthalenesulfonates, naphthalenesulfonic acid-formalin condensates, dialkyl sulfosuccinates, alkyl phosphates, polyoxyethylene sulfates, alkylamine salts, quaternary ammonium salts, polyoxyethylene alkylamines, polyoxyethylene alkyl ethers, polyoxyethylene alkylphenol ethers, sorbitan fatty acid esters, polyoxyethylene fatty acid esters, hydroxyethylene sorbitan fatty acid esters, hydroxyethylenehydroxypropylene block polymers, fatty acid monoglycerides, and alkyl betaines, by irradiation with plasma, and then washing away the uncrosslinked portion of said surfactant with water or the like solvent to obtain an extremely thin film.

4,056,457

METHOD OF DEPOSITING LOW STRESS HAFNIUM THIN FILMS

John Louis Vossen, Jr., Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,550
Int. Cl.[2] C23C *15/00*; B32B *9/00*
U.S. Cl. 204—192 SP 7 Claims

1. A method for depositing adherent films of hafnium metal on an alumina or sapphire substrate which comprises radio frequency vacuum sputtering a hafnium target in an inert gaseous plasma atmosphere at deposition rates of over 175 Angstroms per minute onto said substrate, said substrate being maintained at minimum bias with respect to said plasma atmosphere.

5. A composite comprising a layer of hafnium adhered to a sapphire substrate and deposited by the method of claim 1.

4,056,458

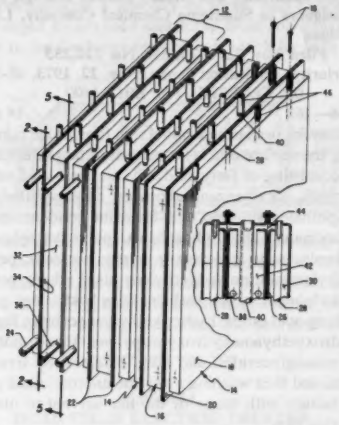
MONOPOLAR MEMBRANE ELECTROLYTIC CELL

Gerald R. Pohto, Mentor; Michael J. Kubrin, Chardon, and Robert C. Sutter, Painesville, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Aug. 26, 1976, Ser. No. 718,060
Int. Cl.[2] C25B *9/00, 15/08, 11/02*
U.S. Cl. 204—263 29 Claims

1. A monopolar membrane electrolytic cell comprising: two end electrode pans of identical configuration having a peripheral flange therearound; end electrode elements connected to the interior depression of each of said end electrode pans; a central electrode frame having peripheral flanges on each side thereof to match the corresponding flanges of said end electrode pans for sealing engagement when connected to form the monopolar membrane electrolytic cell; a bifurcated central electrode element such that each presents a substantially planar surface to said corresponding end electrode element connected to the interior of said central electrode frame; a membrane separating said end electrode elements from said central electrode element when the cell is assembled; current distributors

to supply electrical energy of opposite polarity to said central electrode elements and said end electrode elements; and at least



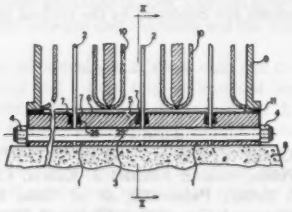
one access port in each compartment for adding materials or removing products.

4,056,459

ANODE ASSEMBLY FOR AN ELECTROLYTIC CELL

Stelio Ritti, Rome, and Silvio Policardi, Ferrare, both of Italy, assignors to Solvay & Cie, Brussels, Belgium

Filed Apr. 9, 1976, Ser. No. 675,492
Claims priority, application France, Apr. 25, 1975, 75.13313
Int. Cl.[2] C25B *1/26, 9/02*
U.S. Cl. 204—286 **16 Claims**



1. An anode assembly for an electrolytic cell comprising, a plurality of upstanding parallel anode plates spaced from each other, support means for supporting the anode plates and for providing electrical current thereto comprising metallic beams between the anode plates, fluid-tight caps over the beams having bent marginal edge portions bent downwardly along the sides opposed to the anode plates, each beam having on opposite longitudinal sides thereof grooves open to the top of the beams and to the sides thereof, said bent marginal edge portions of each cap being bent into the longitudinal side grooves of the corresponding beam covered by the respective cap, a sealing material along the bent marginal edge portions on a side thereof toward the individual anode plates defining sealing joints.

4,056,460

PROCESS FOR LIQUEFYING CARBONACEOUS MATERIALS OF HIGH MOLECULAR WEIGHT AND FOR SEPARATING LIQUEFACTION PRODUCTS

John M. Malek, P.O. Box 71, Lomita, Calif. 90717

Filed Dec. 1, 1975, Ser. No. 636,450
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—8 **15 Claims**

5. In a process for hydrogenating and liquefying coal, wherein coal is subjected in a coal liquefaction medium to the chemical action of hydrogen under elevated temperature and pressure, in which process gasiform products are separated from hydrogenated slurryform products comprising liquid and solid products including materials with structures composed of acidic phenolic components and basic amino-components, the improvement for increasing coal conversion rates, being characterized by agitating the slurryform products in the presence of an alkaline hydroxide in the presence of water, for binding acidic phenolic components in said products to form phenolic salts and lower the viscosity of the slurryform, separating the slurryform which was agitated into a solid residue rich portion, a liquid product portion rich in phenolic compounds, and a liquid portion comprising amines, and recycling and admixing at least a part of the liquid portion comprising amines to said liquefaction medium.

8. In a process for hydrogenating and liquefying coal, wherein coal is subjected in a coal liquefaction medium to the chemical action of hydrogen under elevated temperature and pressure, in which process gasiform products are separated from hydrogenated slurryform products comprising liquid and solid products including materials with structures composed of acidic phenolic components and basic amino-components, the improvement for increasing coal conversion rates being characterized by agitating the slurryform products in the presence of an inorganic acid in the presence of water, for binding basic components in the slurryform and lower the viscosity thereof, while forming salts and adducts of amines with said inorganic acid, separating the slurryform which was agitated into a solid residue portion, a liquid product portion rich in said salts and adducts, and a liquid portion comprising phenols, and recycling and admixing a part of the liquid portion comprising phenols to said coal liquefaction medium.

4,056,461

RETORTING PROCESS UTILIZING A FLEXIBLE, HELICAL SHAPED CONVEYOR

Jack W. Unverferth, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 25, 1976, Ser. No. 700,378
Int. Cl.[2] C10G *1/02;* C10B *49/16*
U.S. Cl. 208—11 R **10 Claims**

1. A continuous process for retorting hydrocarbon-containing solids which comprises:

a. introducing a solid heat-transfer material at an elevated temperature and hydrocarbon-containing solids into a first section of a stationary, elongated vessel;

b. conveying said heat-transfer material and said hydrocarbon-containing solids through said vessel by means of a flexible generally helical shaped, elongated, hollow longitudinal core, rotating conveyor disposed in said vessel throughout a substantial portion thereof, whereby said hydrocarbon-containing solids and said heat-transfer material are intermixed and sufficient heat is transferred from said solid heat-transfer material to said hydrocarbon-containing solid to raise the temperature of said hydrocarbon-containing solids to an elevated retorting temperature in said first section of said vessel;

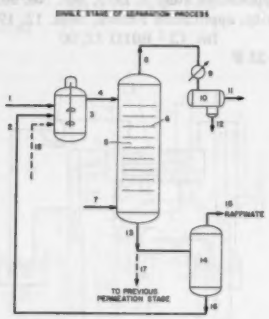
c. introducing a stripping gas at an elevated temperature into a third end section of said vessel downstream from the location where said hydrocarbon-containing solids are introduced, and passing said stripping gas through said third section of said vessel in countercurrent flow relative to the flow of said hydrocarbon-containing solids;

d. withdrawing at an elevated temperature an effluent stream from a second middle section of said vessel, said effluent stream comprising said stripping gas, entrained liquid and gaseous hydrocarbons and finely-divided solids;
e. withdrawing at an elevated temperature retorted solids and said heat-transfer material from said third section of said vessel;
f. separating the condensable hydrocarbons from said effluent stream.

4,056,462
SEPARATING HYDROCARBON MIXTURES BY EMULSIFICATION

Norman N. Li, Edison, and Robert P. Cahn, Millburn, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 25, 1973, Ser. No. 382,468
Int. Cl.[2] B01J *17/34;* C10G *31/00*
U.S. Cl. 208—308 **15 Claims**



1. A process for separating components from a hydrocarbon containing liquid mixture which comprises emulsifying said liquid mixture in an immiscible liquid, thereby forming a discontinuous phase of said hydrocarbon containing liquid mixture in a continuous phase of said immiscible liquid, said immiscible liquid being characterized as a solvent for said components, and contacting said emulsion with an inert gas at conditions whereby said liquid mixture is restrained from boiling and said components pass into said immiscible liquid and are removed therefrom by said inert gas.

4,056,463
TOBACCO/PAPER SORTER METHOD AND APPARATUS

Charles D. Hansen, Jr., Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

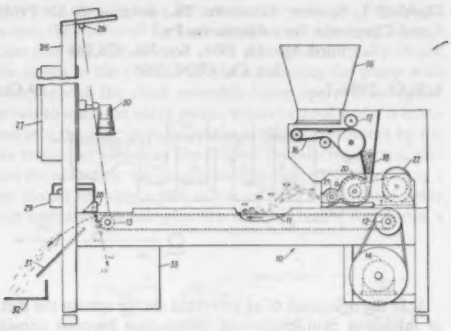
Filed Aug. 19, 1976, Ser. No. 715,779
Int. Cl.[2] B07C *5/344*
U.S. Cl. 209—111.7 R **9 Claims**

1. The method of removing paper particles randomly mixed in reclaimed shredded tobacco from defective cigarettes, comprising the steps of

creating a shower of the shredded tobacco with paper particles to form a blanket of shredded tobacco with paper particles exposed on top of the formed blanket,

electro-optically scanning the blanket of shredded tobacco to detect exposed paper particles;

propelling the scanned blanket of shredded tobacco along a path of flight; and

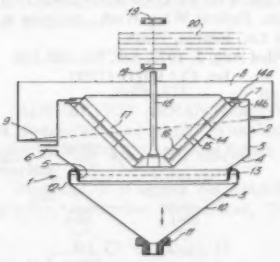


pneumatically diverting detected paper particles from the path of flight.

4,056,464
MINERAL JIGS

Donald James Cross, 3 Grange Road, Bearsden, Glasgow G61 3PL, Scotland

Filed May 17, 1976, Ser. No. 686,897
Claims priority, application United Kingdom, May 23, 1975, 22505/75
Int. Cl.[2] B03B *5/16*
U.S. Cl. 209—425 **14 Claims**

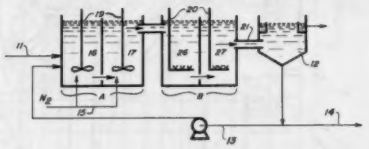


1. A mineral jig comprising a container for water, pulsating means to cause said water to pulsate in the container, an inlet to the container for water, a rotor mounted for rotation about a vertical axis and including a rotary frusto-conical bed in the container; said bed having a permeable frusto-conical wall; an inlet discharging into the bed for slurry; an outlet from the container for concentrated slurry; said rotor being connectible to a drive and the frusto-conical bed being arranged such that a slurry vortex is formed thereon on rotation of the bed whereby material separation is achieved by heavier materials of the slurry passing through the permeable frusto-conical wall of the bed while lighter materials move up the frusto-conical wall for discharge from an upper end of the bed; and receiving means at the upper end of the bed for lighter materials discharged from the bed.

4,056,465
PRODUCTION OF NON-BULKING ACTIVATED SLUDGE

Marshall L. Spector, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 12, 1976, Ser. No. 676,266
Int. Cl.² C02C *1/06*
U.S. Cl. 210—7 **19 Claims**



1. In the operation of an activated sludge system the method of inhibiting proliferation of filamentous biomass consisting essentially of:

producing a mixed liquor by mixing in an initial contact zone recycled activated sludge with BOD-containing wastewater influent; said initial contact zone being maintained under anaerobic conditions such as to be substantially free of NO_x^- and to contain a concentration of less than 0.7 ppm dissolved oxygen; thereby effecting selective production of nonfilamentous microorganisms capable of sorbing BOD;

oxidizing BOD in the mixed liquor in a subsequent oxygenated zone to cause removal of BOD by contact with oxygen-containing gas admitted to said oxygenated zone, said oxygenated zone having maintained therein a dissolved oxygen content of at least 1 ppm;

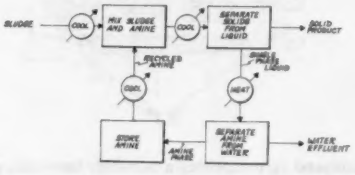
transferring the oxidized mixed liquor from said oxygenated zone to a settling zone wherein purified supernatant liquid is separated from settled sludge;

and returning a portion of said settled sludge to said initial contact zone to provide the activated sludge admixed therein with the wastewater influent.

4,056,466
METHOD OF DEWATERING MATERIAL CONTAINING SOLID MATTER AND BOUND AND UNBOUND WATER

Hans H. Peters, Federal Way, Wash., assignor to Resources Conservation Co., Renton, Wash.

Filed Aug. 3, 1973, Ser. No. 385,488
Int. Cl.² B01D *11/00*
U.S. Cl. 210—10 **7 Claims**



1. In the process for dewatering a sludge containing solid matter and water including the steps of

admixing said sludge with an amine to form a mixture, said amine having the formula

wherein:

R_1 is hydrogen or alkyl,

R_2 and R_3 are alkyl radicals having from one to six carbon atoms or alkenyl radicals having from two to six carbon atoms, and

the total number of carbon atoms in the molecule being in the range of from three to seven, inclusive, said amine having an inverse critical solution temperature in a two phase system with water,

adjusting the temperature of said mixture below said inverse critical solution temperature to form a single phase liquid and a solid phase containing at least a portion of said solid matter which is insoluble in said single phase liquid, and

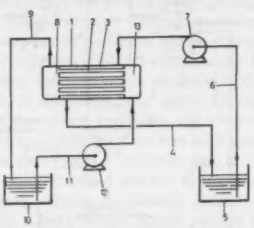
separating said solid phase from said single phase liquid, the improvement comprising:

maintaining the temperature of said mixture below said inverse critical solution temperature while admixing said amine and said sludge and until said solid phase is separated from said single phase liquid.

4,056,467
HOLLOW FIBRES

Gilbert Christen, Lyon; Bernard Favre, Ecully; Xavier Marze, Lyon; Michel Salmon, Mions, and Rene Thuillier, Morance, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 395,155, Sept. 7, 1973, Pat. No. 3,930,105.
This application June 3, 1975, Ser. No. 583,168
Claims priority, application France, Sept. 12, 1972, 72.32285
Int. Cl.² B01D *13/00*
U.S. Cl. 210—23 F **8 Claims**



1. In a method of ultrafiltration or dialysis using a membrane, the improvement which comprises

using as the membrane a skinless hollow fiber possessing a continuous longitudinally extending channel from macromolecular material, said fiber consisting essentially of a copolymer of acrylonitrile and an olefinically unsaturated comonomer containing an optionally salified sulfonic acid group, the proportion of optionally salified sulfonic acid groups in said copolymer being between 1 and 50% (by number) of the monomer units and possessing micropores of average diameter less than about 100 A, between 40 and 80% of walls of the fiber being empty space, said fiber possessing zero salt rejection, measured under a pressure of 2 bars for an aqueous solution containing 10 g/l of sodium chloride.

4,056,468
ISOLATION OF COMPONENT MATERIALS OF AQUEOUS SOLUTIONS SOLUBLE IN LIPOPHILIC SOLVENTS

Joachim Breiter, and Roland Helger, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Feb. 25, 1975, Ser. No. 553,023
Claims priority, application Germany, Mar. 2, 1974, 2410033
Int. Cl.² B01D *15/00*
U.S. Cl. 210—31 R **11 Claims**

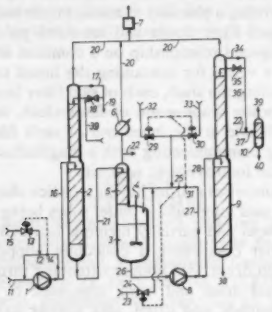
1. In a process for the isolation of lipophilic solvent-soluble components from an aqueous solution containing lipophilic components comprising contacting the aqueous solution with one or both of a silica gel-based or kieselguhr-based concentra-

tion agent to absorb said aqueous solution therein and subsequently extracting substantially only the lipophilic solvent-soluble components from the aqueous solution absorbed in the concentration agent with a lipophilic solvent, the improvement which comprises employing as the concentration agent a flowable silica gel of kieselguhr or a mixture thereof, having an average particle size of 0.05 to 1.0 mm., an average pore volume of 0.2 to 3 ml./g. and a specific surface to 0.2 to 50 $m^2/g.$, and said extracting is conducted without substantial simultaneous desorption of the water of said absorbed aqueous solution, said lipophilic solvent-soluble components being at least one analgesic, sedative, hypnotic, anti-epileptic, psychopharmaceutical, sympathicomimetic, anti-histamine, narcotic, alkaloid, antibiotic, lipid, triglyceride, fatty acid, steroid or porphyrin.

4,056,469
PURIFICATION OF WASTE WATER FROM HYDRAZINE PRODUCTION

Kurt-Wilhelm Eichenhofer, Leverkusen, and Reinhard Schliebs, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 15, 1976, Ser. No. 696,253
Claims priority, application Germany, July 3, 1975, 2529647
Int. Cl.[2] C02C *5/04*
U.S. Cl. 210—62 **9 Claims**



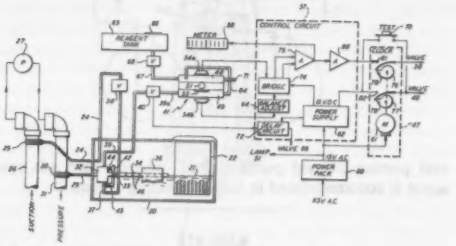
1. A process for the purification of waste water produced in hydrazine production by the oxidation of ammonia or amine with an oxidizing agent in the presence of an aldehyde or ketone, such waste water containing small amounts of hydrazine and organic hydrazine derivatives, comprising intensively mixing the waste water with chlorine or a hypochlorite at a temperature of about 10° C to 110° C and a pH of about 5 to 10 until the treated waste water reaches a redox potential to platinum, relative to Ag/AgCl, of about −400 mV to +800 mV.

4,056,470
AUTOMATIC CHLORINATOR

Anthony P. Carpenter, Sauquoit, N.Y., assignor to Mohawk Video Systems Corporation, Utica, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,465
Int. Cl.[2] E04H *3/16;* **B01D** *11/02*
U.S. Cl. 210—94 **5 Claims**

1. An automatic chlorinator for a swimming pool having a water circulating system including a pump comprising, in combination, a reservoir for storing a chlorine saturated water solution, a dual chambered sample vial having a light source therein, conduit means operably connecting the high pressure side of the pump with the sample vial for introducing pool water into both chambers thereof, means for introducing a metered amount of reagent into one only of the chambers for mixing with the pool water therein, said means for introducing a metered amount of reagent including a reservoir for the reagent, conduit means connecting said reservoir with said one sample vial chamber, and a solenoid valve is said conduit means, a spectral filter for the other of said chambers, a photocell for each chamber, the light source operating to direct light rays onto the photocell for each chamber after passing through its contents and said filter, a clock assembly, normally closed valve means in the conduit means connecting the pump with the sample vial, the clock assembly being operable at regular intervals to open the valve means whereby pool water is introduced into the sample vial chambers, means controlled by the valve means for actuating the reagent introducing means, said means for actuating the reagent introducing means including a delay circuit forming a part of the control circuit, said delay circuit operating to energize the solenoid valve that forms a



part of the reagent introducing means when the valve means tha permits pool water to be introduced into the sample vial chambers de-energizes, the delay circuit including a series connected capacitor and resistor for controlling the time interval that the reagent solenoid valve remains energized, a control circuit for comparing the output signals of the photocells to determine whether the residual chlorine in the pool water is or is not below a predetermined desired level, the control circuit including means for providing an output signal if the residual chlorine is below the predetermined desired level, conduit means operably connecting the reservoir to the low pressure side of the pump, and normally closed valve means in the last-named conduit means openable by said last-named output signal to permit chlorine saturated solution to flow from the reservoir to the pool.

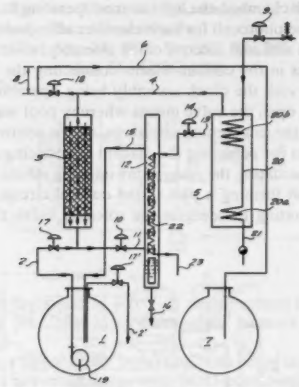
4,056,471
ADSORPTION ARRANGEMENT

Paul Fischer, Regensdorf, and Edward Wisz, Kaiseraugst, both of Switzerland, assignors to Chemische Fabrik Uetikon, Uetikon, Switzerland

Filed Oct. 9, 1973, Ser. No. 404,603
Claims priority, application Switzerland, Oct. 13, 1972, 14984/72
Int. Cl.[2] B01D *35/18*
U.S. Cl. 210—186 **1 Claim**

1. An arrangement for the adsorptive purification of fluids and for the regeneration of the adsorption medium, comprising an adsorption agent; means for contacting a fluid which is convertible between a liquid and a gaseous state with said adsorption agent while said fluid is in one of said states so as to permit impurities from said fluid to be adsorbed and retained by said adsorption agent; and means for converting a portion of the purified fluid from said one state to the other of said states, said converting means and said adsorption agent being in communication during adsorption and conversion thereby permitting said portion of said purified fluid to flow from said adsorption agent to said converting means during the adsorption of impurities from said fluid for conversion of said portion of said purified fluid, and permitting said portion of said purified fluid to flow from said converting means to said adsorption agent

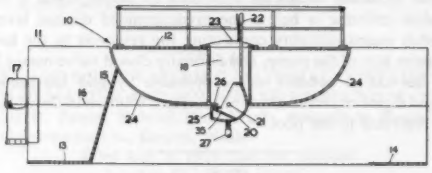
subsequent to said conversion for the removal of adsorbed impurities from and regeneration of said adsorption agent by said portion of said purified fluid, wherein said adsorption agent is accommodated in said converting means.



4,056,472
OIL RECOVERY APPARATUS

Raymond Geoffrey Teasdale, Waterlooville, England, assignor to National Research Development Corporation, London, England

Filed Mar. 12, 1976, Ser. No. 666,321
Claims priority, application United Kingdom, Mar. 13, 1975, 10602/75; June 18, 1975, 26022/75
Int. Cl.[2] E02B *15/04*
U.S. Cl. 210—242 S **12 Claims**

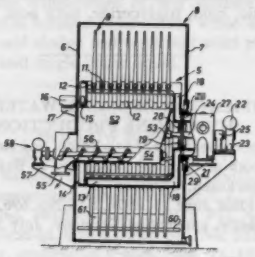


1. Oil recovery apparatus for collecting oil floating on the surface of a body of water, said apparatus comprising a vessel having spaced apart longitudinally extending hulls connected by a bridge structure located between the hulls and having a lower surface inclined downwardly from the front of the vessel toward its rear, the rear edge of said surface being located approximately at the mid-point of the vessel and on its load water line, oil collection means comprising a receptacle having a front wall forming a weir plate member over which oil may enter the receptacle, side walls and a closed bottom, said receptacle being mounted between said hulls in the region of the center of buoyancy of the vessel and being so constructed and arranged that the front wall thereof is located adjacent the rear edge of said bridge structure, means for removing oil from said receptacle, said means comprising an oil suction evacuation conduit, a baffle plate arranged substantially horizontally within said receptacle, spaced above the bottom thereof and having flow equalising slots therein, an open end of said conduit being located adjacent the mid-point of said baffle plate on one side thereof in fluid communication with the space within the receptacle on the other side of said baffle plate via said flow equalising slots, said slots being located in said baffle plate on opposite sides of said conduit, increasing in width toward the opposite ends of said plate and having a total open area substantially equal to that of said conduit open end, the pump means for applying suction to the opposite end of said conduit for removing liquid from said receptacle.

4,056,473
ROTARY FILTER FOR CONCENTRATING FIBER SUSPENSIONS

Bjarne Ivar Nilsson, Takan P1 2372 B, 460 64 Frandefors, Sweden

Filed May 25, 1976, Ser. No. 690,045
Int. Cl.[2] B01D *33/28*
U.S. Cl. 210—331 **6 Claims**



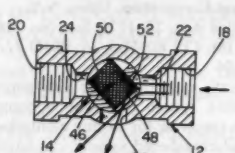
1. In a rotary filter for concentrating fibre suspension and of the type comprising a plurality of annular disks each composed of sector-shaped filter boxes and mounted parallel to each other and in spaced relationship on a common shaft which is journalled in a vessel for containing the liquid to be filtered, means for rotating the shaft, each of said filter boxes having at least two opposite walls made of filter cloth, and an outlet opening for filtrate at the inner end of each filter box, said outlet opening communicating with a longitudinal outlet tube in the shaft, the improvement wherein:

said shaft comprises a drum having a lattice-shaped cylindrical wall, said longitudinal outlet tubes being peripherally spaced about and partially forming said cylindrical wall, and further comprising a collecting hopper positioned within said drum, said hopper extending through an open end of said drum and being supported by a stationary support outside said drum, said hopper having an inlet opening facing upwardly and positioned within the uppermost portion of the interior of said drum, said inlet opening extending along all filter disks carried by said drum to receive concentrated pulp falling down through the lattice-shaped drum wall from those filter surfaces which are at their uppermost positions above the liquid level within said vessel during the rotation of said drum.

4,056,474
STRAINING VALVES

William N. Snouffer, 111 Buena Vista Way, Chapel Hill, N.C. 27514

Filed Apr. 19, 1976, Ser. No. 678,170
Int. Cl.[2] B01D *35/02*
U.S. Cl. 210—390 **7 Claims**



1. A straining valve comprising:

a body having an inlet, an outlet, a chamber for accommodating a valve plug, said chamber being between and

communicating with said inlet and outlet, and a flush port between said inlet and outlet and communicating with said chamber,

a valve plug seated in said chamber and having an axis of rotation, said plug having a plug flow passage therethrough directed transverse of said axis, said plug flow passage having first and second openings at the ends of said passage, said openings respectively aligning with said inlet and outlet for permitting fluid to flow from inlet to outlet when said plug is rotated to a first, valve-open position, and said plug passage having a third opening therefrom through the wall of said plug between said first and second openings, said first opening being large enough to communicate with both said inlet and said flush port when said plug is rotated to a second self-cleaning position, in which position said third opening communicates with said inlet, and

a first filter area positioned in said first opening, and a second filter area positioned in said third opening,

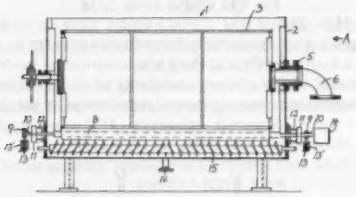
wherein said first filter area filters fluid passing from inlet to outlet in said first, valve-open position, and in said second position part of the fluid from said inlet flows across said first filter area and then out said flush port, to clean said first filter area, and part of the fluid from said inlet passes through said second filter area and is filtered as it passes therethrough, then passes into said plug flow passage, and finally passes out through said first filter area and flush port, to backflush and thereby to further clean the first filter area.

4,056,475

PULP CATCHER

Hanslothar Sander; Siegfried Matusch, and Uwe Hemminghaus, all of Braunschweig, Germany, assignors to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed July 21, 1972, Ser. No. 273,855
Claims priority, application Germany, July 23, 1971, 2136850
Int. Cl.[2] B01D *33/06*
U.S. Cl. 210—402 **6 Claims**



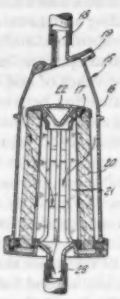
1. A strainer apparatus comprising a housing, straining drum means having a rotational axis, means rotatably supporting said straining drum means in said housing, means connected to said housing to supply material to be strained into said housing, further means also connected to said housing to remove separated material and liquid from said housing, said further means being arranged to maintain a liquid level in said housing, rotatable brush roller means including shaft means located in said housing below said liquid level, sealing means in said housing below said liquid level, said shaft means having ends extending through said sealing means out of said housing, bearing means movably supported outside said housing for rotatably supporting said shaft ends, biasing means operatively connected to said bearing means to urge said bearing means radially toward said rotational axis, and compensating means operatively interconnecting said sealing means and said housing.

4,056,476

BLOOD FILTER MEDIA

Herman Charles Mouwen, Ventura, Calif.; William Lauer, Madison, and Steven Louis Weinberg, East Brunswick, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J. and Purolator, Inc., Del.

Continuation-in-part of Ser. No. 553,703, Feb. 27, 1975, abandoned. This application Sept. 2, 1976, Ser. No. 696,256
Int. Cl.[2] B01D *25/06*
U.S. Cl. 210—446 **2 Claims**



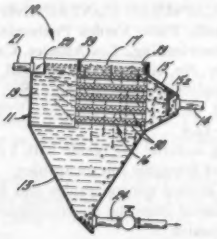
1. In a unit for filtering blood, the improvement comprising an uncalendered, unbonded, woven fabric filter media having a nominal pore size rating of 20 microns, a pore size distribution range of from 17 microns to 23 microns, and woven with monofilament yarns having a yarn diameter of from 30 microns to 36 microns, said media being woven in a two-up and two-down twill weave, whereby the media is stable and retains its nominal pore size rating and pore size distribution range during use.

4,056,477

SEPARATING APPARATUS FOR CLARIFYING LIQUID

Richard B. Ravitts, Rockford, Ill., assignor to Riga, Inc., Rockford, Ill.

Filed June 21, 1976, Ser. No. 697,929
Int. Cl.[2] B01D *43/00*
U.S. Cl. 210—522 **5 Claims**



1. Apparatus for separating suspended settleable and flotable substance from liquid, said apparatus comprising a vessel having an upstream inlet for receiving a substantially horizontal flow of said liquid and having a downstream outlet for discharging said liquid, a separator located in said vessel between said inlet and outlet, said separator having an upstream portion defined by a series of at least first, second and third substantially vertical upstream baffles spaced substantially horizontally from one another across the path of the incoming liquid, said separator having a downstream portion defined by a series of at least first, second and third substantially vertical downstream baffles spaced substantially horizontally from one another and alined with said first, second and third upstream baffles, respectively, the space alined with and located be-

tween said first baffles defining a first channel, the space alined with and located between said second baffles defining a second channel, and the space alined with and located between said third baffles defining a third channel, each of said channels having the same width as its respective baffles and being open across its entire width and along its entire height, said upstream baffles deflecting the incoming flow of liquid into the space between said first and second upstream baffles and into the space between said second and third upstream baffles and preventing any substantial downstream flow into said channels whereby the liquid in said channels is substantially still, said separator further including a first row of vertically spaced and parallel vanes having upstream end portions extending between said first and second upstream baffles and secured to one of the latter baffles, the vanes of said first row having downstream end portions extending between said first and second downstream baffles and secured to one of the latter baffles, said separator further including a second row of vertically spaced and parallel vanes having upstream end portions extending between said second and third upstream baffles and secured to one of the latter baffles, the vanes of said second row having downstream end portions extending between said second and third downstream baffles and secured to one of the latter baffles, the vanes of each of said rows sloping downwardly upon progressing away from said second baffles whereby suspended flotable substance in the liquid flowing horizontally downstream within the spaces between said vanes rise into contact with the undersides of said vanes and are directed upwardly and laterally into said second still channel while the suspended settleable substance in such liquid sink into contact with the upper sides of said vanes and are directed downwardly and laterally by the vanes of said first row into said first still channel and by the vanes of said second row into said third still channel, the vanes of said first row all having lower edges disposed in a common vertical plane coinciding with one side of said first still channel and all having upper edges disposed in a common vertical plane coinciding with the adjacent side of said second still channel, and the vanes of said second row all having upper edges disposed in a common vertical plane coinciding with the other side of said second still channel and all having lower edges disposed in a common vertical plane coinciding with one side of said third still channel.

4,056,478

BEARING MATERIAL EMPLOYING FRANGIBLE MICROCAPSULES CONTAINING LUBRICANT

Alfred J. Capelli, Palos Verdes Peninsula, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 403,453, Oct. 4, 1973, Pat. No. 3,950,047. This application Jan. 15, 1976, Ser. No. 649,528

Int. Cl.[2] C10M *5/00, 7/00;* **F16C** *27/00*

U.S. Cl. 252—12.4 **13 Claims**

1. A bearing material engagable with a member comprising:

a plurality of frangible microcapsules;

a lubricant in said microcapsules and having properties of being released from the microcapsules upon the breaking of the capsules;

a porous body;

said microcapsules being substantially uniformly distributed through at least a portion of said body and being mechanically bonded in the pores of the porous body;

at least said portion of said body at least partially defining a wear surface engagable with the member;

the frangible capsules adjacent said wear surface being breakable upon forcible engagement of the wear surface and the member whereby the lubricant in such broken capsules is released to lubricate said wear surface;

said body including a binder forming a matrix, said matrix defining at least a portion of said wear surface, said capsules being substantially uniformly distributed throughout said matrix; and

said body including a fabric backing member defining the pores for mechanically bonding the microcapsules relative to the body.

4,056,479

MAGNESIUM CARBOXYLATE-SULFONATE COMPLEXES

Derek Redmore, Ballwin, and Frederick T. Welge, Webster Groves, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 17, 1976, Ser. No. 686,707

Int. Cl.[2] C10M *3/18, 5/14, 7/20;* **C10L** *1/32*

U.S. Cl. 252—18 **2 Claims**

1. A process of preparing a stable dispersion of a basic, magnesium-containing, inorganic compound having a magnesium content of about 12.5% to about 14.6% which comprises (a) admixing (1) a glycol ether solution of an oil-soluble magnesium alkoxide-carbonate complex, said complex having been prepared from a glycol ether having not more than 8 carbon atoms, (2) an oil-soluble sulfonate, (3) a carboxylate- and/or phenate dispersing agent, (4) a volatile carrier and (5) water in excess of the stoichometric requirement for hydrolysis of said magnesium-alkoxide-carbonate complex,

b. hydrolyzing the magnesium-alkoxide-carbonate complex to an oil-soluble magnesium-containing inorganic compound, at reflux temperature for a period of about 1 to 2 hours, and then

c. removing the volatile carrier to the desired viscosity,

d. said process being characterized further in that the magnesium-alkoxide-carbonate complex of step (a) is prepared by a process comprising

1. reacting magnesium with a glycol ether having not more than 8 carbon atoms to form the magnesium alkoxide; and

2. reacting the magnesium alkoxide with from 0.5 to about 1.5 mols of carbon dioxide per mole of said magnesium alkoxide to form a magnesium-alkoxide-carbonate complex.

2. The product obtained by the process of claim **1.**

4,056,480

HYDRAULIC FLUIDS

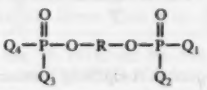
John F. Herber, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed June 10, 1975, Ser. No. 585,636

Int. Cl.[2] C10M *3/40, 3/38*

U.S. Cl. 252—78.5 **4 Claims**

1. A method of transmitting force from one point to another utilizing a hydraulic fluid as the force transmitting medium, the improvement which comprises utilizing as said force transmitting medium at least one compound represented by the structure



where Q_1 is —O—R_1 or

Q_2 is —O—R_4 or

Q_3 is —O—R_7 or

Q_4 is —O—R_{10} or

R is nonphenolic alkylaryl, R containing from 1 to 16 carbon atoms; provided that the —O—R—O—portion of the structure is non-phenolic; R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10}, R_{11} and R_{12} each contain from 1–12 carbons and are individually selected from the group consisting of linear alkyl, branched alkyl, cyclic alkyl, nonphenolic alkylaryl, or substituted cyclic alkyl and can be the same or different in any combination.

4,056,481

DETERGENT COMPOSITION

John Robert Tate, Whitley Bay, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 9, 1975, Ser. No. 539,756

Claims priority, application United Kingdom, Jan. 11, 1974, 1370/74

Int. Cl.² B02D *19/04;* **C11D** *3/16, 3/18*

U.S. Cl. 252—140 **11 Claims**

1. A granular built detergent composition which comprises:

a. from about 2% to about 40% by weight of an organic synthetic detergent selected from the group consisting of nonionic, zwitterionic, and anionic detergents and mixtures thereof;

b. from about 0.02% to about 5% by weight of a substantially water-insoluble microcrystalline wax having a melting point in the range from 35° C to 115° C and saponification value less than 100 or mixtures thereof; and

c. from about 10% to about 90% by weight of detergency building salt or mixtures thereof; said wax in intimate admixture with the said organic detergent.

4,056,482

METHOD FOR PREPARING AQUEOUS, RADIOACTIVE WASTE SOLUTIONS FROM NUCLEAR PLANTS FOR SOLIDIFICATION

Helmut Schmieder, Karlsruhe, and Reinhard Kroebel, Leopoldshafen, both of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Oct. 20, 1975, Ser. No. 624,108

Claims priority, application Germany, Oct. 18, 1974, 2449588

Int. Cl.² G21F *9/04*

U.S. Cl. 252—301.1 W **8 Claims**

5. A method for preparing aqueous, radioactive waste solutions, from reprocessing plants for spent nuclear fuel and/or breeder materials and other nuclear plants, for non-contaminating solidification and/or removal of such solutions, in which the total quantity of the various inorganic and organic substances is reduced by the destruction of nitric acid, nitrates and nitrites and formation of a waste gas mixture which is practically free of higher nitrous oxides, said solution containing at least one substance selected from the group consisting of nitric acid, nitrate, and nitrite, and at least one substance selected from the group consisting of hydrazine, hydroxylamine, oxalic acid, oxalates, tartaric acid and tartrates comprising subjecting the radioactive waste solution to an electrolysis current in an electrolysis cell that does not contain a diaphragm at such current densities at the anode and at the cathode that, in one process step, those substances selected from the group consisting of hydrazine, hydroxylamine, oxalic acid, oxalates, tartaric acid and tartrates that are present are oxidized at the anode and those substances selected from the group consisting of nitric acid, nitrates and nitrites that are present are reduced at the cathode.

4,056,483

PROCESS FOR PRODUCING SYNTHESIS GASES

Gerhard Baron, Hofheim; Herbert Bierbach; Carl Hafke, both of Frankfurt am Main, and Günter Pockrandt, Bad Homburg, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Ruhrgas Aktiengesellschaft, Essen, both of, Germany

Filed July 12, 1976, Ser. No. 704,258

Claims priority, application Germany, July 18, 1975, 2532197

Int. Cl.² C01B *2/02;* **C10J** *3/00*

U.S. Cl. 252—373 **13 Claims**

1. The production of a synthesis gas comprising carbon monoxide and hydrogen, by a process comprising gasifying coal in a first reaction zone under a pressure of about 5–150 bars in counterflow to oxygen and water vapor to produce a water vapor-containing raw gas having a temperature of about 350° – 700° C, feeding said raw gas without cooling same, into a second reaction zone and reacting it non-catalytically with oxygen under a pressure of about 5–150 bars, said second reaction zone containing a bed of heat-resisting inert granular material having a particle size of about 3–80 mm, withdrawing from said second reaction zone an intermediate product gas having a temperature between about 800° C and 1400° C, cooling the intermediate product gas and freeing it from sulfur compounds.

4,056,484

STABLE BLOOD PLASMA, PROCESS FOR PREPARING IT AND ITS USE AS COMPARATIVE PLASMA IN COAGULATION TESTS

Norbert Heimburger; Axel Sieber, both of Marburg, Lahn, and Horst Schwinn, Marburg-Michelbach, all of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Lahn, Germany

Filed Dec. 29, 1975, Ser. No. 644,519

Claims priority, application Germany, Dec. 31, 1974, 2461969

Int. Cl.² G01N *33/16*

U.S. Cl. 252—408 **4 Claims**

1. Lyophilized blood plasma containing an anti-coagulating agent and present in a sealed container under a protective gas containing at least 5 percent of carbon dioxide.

4,056,485

STABLE COLORED REFERENCE STANDARD FOR ENZYMATIC DETERMINATIONS

Paul K. Adolf, Easton, Pa., and James J. Carroll, East Hanover, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 512,261, Oct. 4, 1974, abandoned. This application Feb. 4, 1976, Ser. No. 655,180

Int. Cl.² C09K *3/00;* **G01N** *31/06, 31/22, 31/14*

U.S. Cl. 252—408 **15 Claims**

1. A colored reference standard for use in diagnostic determinations involving enzymatic reactions in which 1-(p-iodophenyl)-5-(p-nitrophenyl)-3-phenylformazan is produced, which comprises an aqueous solution of:

A. From about 0.001% to about 0.020% by weight, based on the weight of the total solution, of 1-(p-iodophenyl)-5-(p-nitrophenyl)-3-phenylformazan;

B. From about 0.01% to about 0.10% by weight of serum albumin;

C. From about 1.76% to about 10% by weight of solvent selected from the group consisting of N,N'-dimethylformamide and dimethylsulfoxide; and

D. From about 1.45% to about 10% by weight of isopropyl alcohol;

said aqueous color standard solution having an absorbence maximum at 500 nanometers.

7. A lyophilized colored reference standard for use in diagnostic determinations involving enzymatic reactions in which 1-(p-iodophenyl)-5-(p-nitrophenyl)-3-phenylformazan is produced, obtained by a process which comprises:

A. Completely dissolving from about 0.001% to about 0.020% by weight of 1-(p-iodophenyl)-5-(p-nitrophenyl)-3-phenylformazan, in about 1.76% to 10% by weight of solvent selected from the group consisting of N,N'-dimethylformamide and dimethylsulfoxide;

B. Adding from about 1.45% to about 10% by weight of isopropyl alcohol to (A) slowly, and mixing thoroughly;

C. Dissolving from about 0.01% to about 0.1.0% by weight of serum albumin and from about 5% to about 20% by weight of inert bulking agent in water;

D. Adding solution (B) to solution (C) slowly, with stirring; and

E. Lyophilizing the solution of (D);

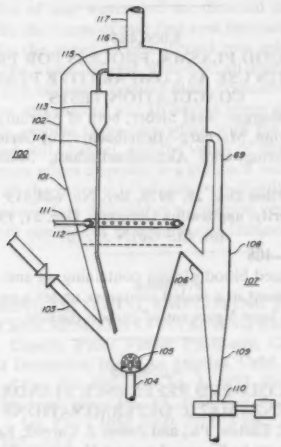
said percentages by weight being based on the weight of the total solution, prior to lyophilization.

4,056,486

FLUIDIZED CATALYTIC CRACKING REGENERATION PROCESS

Dorrance P. Bunn, Jr.; John C. Strickland, and Douglas H. May, Jr., all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 7, 1976, Ser. No. 684,439
Int. Cl.[2] B01J *29/38, 21/20;* **C10G** *11/18*
U.S. Cl. 252—417 **8 Claims**



1. In a fluidized cracking catalyst regeneration process wherein a spent, coke-contaminated cracking catalyst is contacted with a molecular oxygen containing regeneration gas, in a single regeneration vessel, at catalyst regeneration conditions, for burning substantially all the coke from said spent catalyst, producing a spent regeneration gas comprising carbon dioxide and carbon monoxide and substantially depleted in oxygen, and a hot regenerated catalyst substantially reduced in residual carbon suitable for cracking a hydrocarbon charge; the improvement which comprises:

a. contacting, in the bottom of a frustoconical first regeneration zone, having a closed bottom and an open top spent catalyst with an amount of molecular oxygen containing primary regeneration gas sufficient to provide about the stoichometric amount of oxygen for complete combustion of coke under turbulent flow conditions for forming an intimate mixture of spent catalyst and primary regeneration gas;

b. flowing said mixture of spent catalyst and primary regeneration gas upward, at catalyst regeneration conditions, at superficial vapor velocities of about 5–8 ft/sec near the bottom decreasing to about 2.5–4.5 ft/sec at the top of said first regeneration zone, for forming a fluidized dense phase bed of catalyst having an upper surface within said first regeneration zone;

c. withdrawing hot, regenerated catalyst from the upper portion of said fluidized dense phase catalyst bed for use in cracking hydrocarbon charge stock;

d. disengaging spent regeneration gas containing entrained catalyst from the upper surface of said fluidized dense phase catalyst bed;

e. flowing said spent regeneration gas and entrained catalyst from the open top of said first regeneration zone into the bottom of a frusto-conical second regeneration zone, having an open top and open bottom in open communication with the top of said first regeneration zone, at a superficial vapor velocity in the range of about 2.5–4.5 ft/sec at the bottom decreasing to about 1.0–2.2 ft/sec at the top of said second regeneration zone such that a major portion of the entrained catalyst returns under the influence of gravity to the upper surface of said fluidized dense phase catalyst bed, and a dilute phase of catalyst suspended in spent regeneration gas exits the top of said second regeneration zone;

f. radially distributing a molecular oxygen containing secondary regeneration gas into said second regeneration zone in an amount to provide the equivalent of about 1–10 percent of the oxygen in said primary regeneration gas for combusting substantially all the carbon monoxide in said spent regeneration gas to carbon dioxide;

g. separating, in a separation zone, said dilute phase into a hot catalyst fraction and a flue gas fraction essentially free of entrained catalyst;

h. venting said flue gas fraction from the regeneration process;

i. flowing said hot, separated catalyst fraction from the separation zone to the bottom of the first regeneration zone for contact with additional spent catalyst and primary regeneration gas.

4,056,487

VANADIUM PHOSPHORUS OXYGEN OXIDATION CATALYSTS USEFUL FOR PREPARING ANHYDRIDES FROM ALKANES

Ralph O. Kerr, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Oct. 2, 1975, Ser. No. 618,959
Int. Cl.[2] B01J *27/14*
U.S. Cl. 252—435 **12 Claims**

1. A catalyst composition for use in the partial oxidation to C_4 to C_{10} alkane hydrocarbons to anhydrides consisting of vanadium, phosphorus, oxygen and a modifying component consisting of the elements Nb, Cu, Mo, Ni, Co and Cr or the elements Nb, Cu, Mo, Ni, Co and Cr and one or more of the elements selected from the group of Ce, Nd, Ba, Hf, U, Ru, Re, Li, or Mg, wherein the atomic ratio of vanadium:phosphorus:-modifying component is 1:0.90 to 1.3:0.005 to 0.4, respectively.

4,056,488

SYNTHETIC AMORPHOUS SILICAS OF PREDETERMINED PORE DISTRIBUTION, METHOD OF PRODUCING SAME

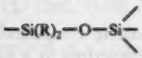
Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 450,967, March 14, 1974, Pat. No. 3,983,055. This application Dec. 8, 1975, Ser. No. 638,866
Int. Cl.[2] B01J *21/08, 29/00*
U.S. Cl. 252—449 **15 Claims**

1. A synthetic amorphous solid having shape selective properties prepared by the steps of hydrolyzing and polymerizing

in the presence of water a silane having the formula $R(Si)X_3$ wherein R is a nonhydrolyzable organic group, X is a hydrolyzable group and (Si) is selected from the group consisting of

and



and calcining the polymerzied product.

13. The solid of claim 3 wherein X is alkoxy of from 1 to 10 carbon atoms.

4,056,489

HIGH TEMPERATURE STABLE CATALYST COMPOSITION AND METHOD FOR ITS PREPARATION

Saul G. Hindin, Mendham, and George R. Pond, Elizabeth, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Division of Ser. No. 423,093, Dec. 10, 1973, Pat. No. 3,966,391.
This application Apr. 5, 1976, Ser. No. 673,683
Int. Cl.[2] B01J *21/04, 23/10, 23/64*
U.S. Cl. 252—462 21 Claims

1. A catalyst composition consisting essentially of (a) a catalytically-active calcined composite of alumina, a rare earth metal oxide and a mixture of two metal oxide components wherein the first metal oxide component is selected from the group consisting of an oxide of chromium, tungsten and mixtures thereof and the second oxide component is selected from the group consisting of an oxide of calcium, strontium, barium, silicon, tin and mixtures thereof, said composite having been formed by calcination at a temperature of at least 500° C. and being characterized by a surface area of at least 20 m^2/g when heated for 2 hours at 1200° C.; and (b) a catalytically-effective amount of a platinum group metal incorporated in said calcined composite after calcination of said composite at a temperature of at least 500° C.

4,056,490

DEHYDROGENATION PROCESS AND CATALYST

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation of Ser. No. 477,401, June 7, 1974, abandoned. This application Nov. 21, 1975, Ser. No. 634,207
Int. Cl.[2] B01J *23/00, 27/06;* C01G *37/14*
U.S. Cl. 252—468 17 Claims

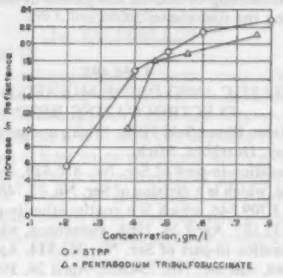
1. In a process for the preparation of magnesium chromite for use in cyclic dehydrogenation comprising the steps of intimately mixing precursors of magnesium chromite and heating said precursors to a temperature in the range of 550° to 900° C said precursors being nitrates, hydroxides, hydrates, oxalates, carbonates, acetates, formates, halides or oxides, wherein the improvement comprises forming said chromite in an essentially inert atmosphere of nitrogen, helium, neon, argon, krypton, xenon, radon or mixtures thereof, which may contain up to about 3 mole percent of a reactive gas as determined in a static atmosphere.

4,056,491

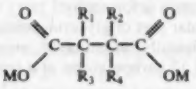
DETERGENT COMPOSITIONS OF TRISULFOSUCCINIC ACID

Donald R. Nielsen, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 494,669, Aug. 5, 1974, Pat. No. 3,991,104.
This application July 30, 1976, Ser. No. 710,056
Int. Cl.[2] C11D *1/22, 3/34*
U.S. Cl. 252—557 9 Claims



1. A detergent composition consisting essentially of:
a. 100 parts by weight of a surfactant selected from the group consisting of anionic, cationic, and non-ionic synthetic surfactants; and
b. 10 to 1,000 parts by weight of trisulfosuccinic acid or its salts described by the formula:



where one of R_1, R_2, R_3 or R_4 is a hydrogen ion and the remainder are SO_3M; and where M may be the same or different cation selected from hydrogen or an alkali metal.

4,056,492

PROCESS FOR THE PRODUCTION OF A BODIED SILICONE RESIN WITHOUT THE USE OF A CATALYST

Duane F. Merrill, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed June 24, 1976, Ser. No. 699,735
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 S 13 Claims

12. An encapsulating film composed of a silicone resin having a viscosity in the range of 40,000 to 100,000 centipoise which is produced by a process comprising (a) adding an organohalosilane to a homogeneous hydrolysis mixture where there is present per part of organohalosilane from at least 1.7 to 10 parts of water and from at least 0.2 to 5 parts of acetone and from 0 to about 1 mole of an aliphatic monohydric alcohol having from 1 to 8 carbon atoms per mole of halogen attached to the silicone of the organohalosilane to produce a silicone resin hydrolyzate; (b) separating the acid/water layer from the silicone resin hydrolyzate; (c) adding to the silicone resin hydrolyzate at least 5% by weight of water based on the silicone resin hydrolyzate; (d) heating the silicone resin hydrolyzate gradually for a period of time of 1 to 8 hours to at least 130° C; and (e) removing the water and acetone from the silicone resin hydrolyzate to leave the silicone resin wherein organohalosilane is selected from the group consisting of (1) organotrihalosilane; (2) a mixture of organotrihalosilane and diorganodihalosilane; (3) a reaction product of an aliphatic monohydric alcohol having from 1 to 8 carbon atoms and a member selected from the class consisting of organotrihalosilane, and a mixture of organotrihalosilane and diorganodihalosilane, which reaction product can have substituted

an average of up to one alkoxy radical per halogen radical; (4) a mixture of the reaction product of (3) and a member selected from organotrihalosilane and diorganodihalosilane, and wherein the organo groups of said organohalosilane and the silicone resin are selected from the class consisting of monovalent hydrocarbon radicals, and halogenated monovalent hydrocarbon radicals.

13. The encapsulating film of claim 12 which is cured by the addition of 0.05% to 1% by weight based on the silicone resin of metal salt of a carboxylic acid, the metal being selected from the class consisting of lead to manganese in the periodic table, and heating the film above 200° C.

4,056,493

TRIMELLITIC ANHYDRIDE MODIFIED URETHANE ELECTROCOATING RESINS

Ivan H. Tsou, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 316,320, Dec. 29, 1972, abandoned, which is a division of Ser. No. 75,748, Sept. 25, 1970, Pat. No. 3,709,846, which is a continuation-in-part of Ser. No. 733,187, April 24, 1968, abandoned, which is a continuation-in-part of Ser. No. 363,814, April 30, 1965, abandoned, and Ser. No. 734,825, April 24, 1968, abandoned. This application Mar. 4, 1974, Ser. No. 448,161

Int. Cl.[2] C08G *18/12*

U.S. Cl. 260—22 TN **1 Claim**

1. In a bath composition for electrodepositing paint on an anode and comprising on a pigment and particulate fillerfree basis an aqueous dispersion of a film-forming, polycarboxylic acid paint binder resin at least partially neutralized with water-soluble base, the improvement wherein said polycarboxylic acid paint binder resin is formedby:

a. reacting 1 molar part of glycerine with 1 molar part of an acyclic, olefinically unsaturated monocarboxylic fatty acid of about 18 carbon atoms at a temperature of about 230° C.

b. reacting the product of (a) with 2 molar parts of toluene diisocyanate at a temperature of about 75° C.,

c. reacting the product of (b) with 2 molar parts of diethylene glycol at a temperature of about 75° C., and

d. reacting the product of (c) with about 0.5 to about 2 molar parts of trimellitic anhydride at a temperature of about 165° C.

4,056,494

JOINT SUSPENSIONS OF MIXED PIGMENTATIONS ACHIEVED BY ACTIVE EFFECTS OF PLANT PHOSPHATIDES

Max Kronstein, Bronx, N.Y., and Joseph Eichberg, Atlanta, Ga., assignors to American Lecithin Company, Atlanta, Ga.

Filed Mar. 7, 1975, Ser. No. 556,309

Int. Cl.[2] C09D *3/54, 3/64, 5/02*

U.S. Cl. 260—22 A **17 Claims**

1. The process of overcoming in a coating composition that includes a fluid vehicle which is compounded with a mixture of powdered or granular solid pigment components, said solid pigment components having different specific gravities, the tendency of said solid pigment components, upon storage, to separate from each other in accordance to their specific gravity, which comprises incorporating lecithin or a modification thereof, said modification having been obtained by hydroxylating or bleaching lecithin, into said coating composition containing said solid pigment components in an amount effective to significantly improve the storage stability of said solid pigment components in said coating composition, said effective amount of said lecithin, of said modification thereof, being 5.5 percent by weight, or more, based on the weight of said solid pigment components, said effective amount being more than the amount of said lecithin, or said modification thereof, required for the optimum wetting and dispersion of said solid components in said coating composition and said coating composition returns to the original color and state said coating composition originally had upon mixing or shaking of said coating composition after a storage period.

4,056,495

HIGH SOLID ALKYD RESIN COATING COMPOSITION CURABLE AT AMBIENT TEMPERATURE

Masahumi Kawamura; Wataru Takahashi, and Tadashi Watanabe, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

Filed July 8, 1975, Ser. No. 593,955

Claims priority, application Japan, July 10, 1974, 49-78831; July 10, 1974, 49-78832

Int. Cl.[2] C09D *3/64, 3/66*

U.S. Cl. 260—22 CA **12 Claims**

1. A high solid coating composition curable at ambient temperatures and characterized by a solid content of at least 80% at 70 KU viscosity which comprises the mixture of:

I. 100 parts by weight of alkyd resin having an oil length of not less than 65%, resin acid value of not more than 7, Gardner-Holdt viscosity (25° C) of not more than Z and solid content of not less than 90% which is prepared by the reaction among (a) saturated aliphatic or aromatic polybasic acids or their acid anhydrides, (b) polyhydric alcohols, and (c) unsaturated vegetable oils or unsaturated vegetable oil fatty acids, and

II. 1 to 10 parts by weight of at least one aluminum alcoholate or chelate thereof.

4,056,496

HYDROGELS AND ARTICLES MADE THEREFROM

William L. Mancini, Framingham; Donald R. Korb, Boston, and Miguel F. Refojo, Lexington, all of Mass., assignors to Corneal Sciences, Inc., Burlington, Mass.

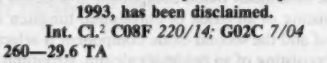
Continuation-in-part of Ser. No. 451,906, March 18, 1974, Pat. No. 3,957,362, which is a continuation-in-part of Ser. No. 294,019, Oct. 2, 1972, abandoned. This application May 13, 1976, Ser. No. 685,996

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.[2] C08F *220/14*; G02C *7/04*

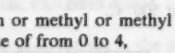
U.S. Cl. 260—29.6 TA **29 Claims**

1. A polymer formed by a free radical, bulk polymerization of a first hydrophilic monomer conforming to the formula:



where R is hydrogen or methyl or methyl and *n* is a whole integer having a value of from 0 to 4,

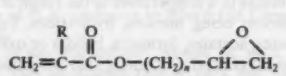
a second substantially water insoluble monomer conforming to the formula:



where R is as above described and R′ is alkyl having from 1 to 6 carbon atoms,

the mole ratio of said first monomer to said second monomer varying between 1:3 and 20:1, and

a third substantially water insoluble monomer conforming to the formula



where R and *n* are as above defined,

the concentration of said third monomer varying between 0 and 30% by weight of the first monomer,

said polymer being insoluble in a member selected from the group of acetone, dioxane and mixtures thereof.

4,056,497

ACRYLIC ESTER COPOLYMERS CAPABLE OF BEING CROSS-LINKED

Rolf Reinecke, Wiesbaden; Karl Josef Rauterkus; Werner Schmieder, both of Kelkheim, Taunus, and Eleonore Lutz, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 358,605, May 9, 1973, abandoned. This application Mar. 4, 1975, Ser. No. 555,137

Claims priority, application Germany, May 15, 1972, 2223630

Int. Cl.[2] C08L *33/00, 31/00*

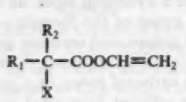
U.S. Cl. 260—29.6 TA 4 Claims

1. An aqueous dispersion of a cross-linkable acrylic ester copolymer, said copolymer consisting essentially of

a. 50 to 95% by weight of monomeric units derived from at least one acrylic acid ester and/or methacrylic acid ester of a saturated aliphatic alcohol having from 1 to 20 carbon atoms,

b. 0.5 to 25% by weight of monomeric units derived from at least one monomer selected from styrene, methyl methacrylate, acrylonitrile, methacrylonitrile, vinyl acetate, vinyl propionate, acrylic amide and methacrylic amide, said (b) monomer being different from said (a) monomer,

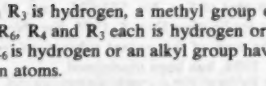
c. 0.5 to 8% by weight of monomeric units derived from an α-haloalkanecarboxylic acid vinyl ester of the formula



wherein R_1 and R_2 each is hydrogen or an alkyl radical having from 1 to 5 carbon atoms and X is fluorine, chlorine, bromine or iodine,

d. 0.5 to 5% by weight of monomeric units derived from at least one α, β-ethylenically unsaturated carboxylic acid having from 3 to 8 carbon atoms or a partial ester thereof with a saturated aliphatic alcohol having from 1 to 20 carbon atoms, and

e. 0.1 to 5% by weight of monomeric units derived from at least one monomer of the formula



wherein R_3 is hydrogen, a methyl group or the group —$COOR_6$, R_4 and R_5 each is hydrogen or a methyl group and R_6 is hydrogen or an alkyl group having from 1 to 12 carbon atoms.

4,056,498

PRODUCTION OF NOVEL RESINS AND THEIR USES IN PRINTING INK COMPOSITIONS

James J. Laurito, Coraopolis, Pa., assignor to Neville Chemical Company, Pittsburgh, Pa.

Filed Jan. 17, 1974, Ser. No. 434,270

Int. Cl.[2] C09F *1/04*

U.S. Cl. 260—23.7 C 15 Claims

1. A dibasic acid-modified hydrocarbon/tall oil resin suitable for use in heat-set and gravure printing ink compositions which resin consists essentially of the reaction product of at least one ethylenically unsaturated lower aliphatic dicarboxylic acid or anhydride with a base resin consisting essentially of a polymerized mixture of: (a) a predominant amount of dicyclopentadiene; and lesser amounts of (b) a mixture consisting essentially of dimerized aliphatic cyclic and non-cyclic dienes of five carbons, and (c) tall oil; the dibasic acid-modified resin having Gardner-Holdt solution viscosities at about 25° C (bubble seconds) of from about 1.65 to about 9.0 (60% in 45 Kauri butanol gravure ink solvent) and from about 10 to about 1000 (50% in 31 Kauri butanol heat set ink solvent).

4,056,499

DEGRADABLE POLYMERIC COMPOSITION

Lynn J. Taylor, Haslett, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 8, 1971, Ser. No. 206,133

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.[2] C08J *3/20*

U.S. Cl. 260—23 H 18 Claims

1. A process for degrading a polymeric composition, which process comprises reacting the polymeric material in the presence of a source of free radicals with a non-polymeric organic reagent R-X, wherein R is at least one aliphatic hydrocarbon group containing at least six carbon atoms and X is at least one polymeric material-degradation-sensitizing group, to produce said degradable polymeric composition, and subsequently exposing said composition to at least one natural environmental condition sufficient to degrade said composition.

4,056,500

AEROSOL-DISPENSED LATEX PAINT COMPOSITIONS

David Stern, Roslyn, N.Y., assignor to Martin Paint and Chemical Corporation, Jamaica, N.Y.

Continuation-in-part of Ser. No. 278,212, Aug. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 168,916, Aug. 4, 1971, abandoned. This application Jan. 20, 1975, Ser. No. 542,220

Int. Cl.[2] C08L *33/08, 31/04;* B65D *35/38*

U.S. Cl. 260—29.6 MN 9 Claims

1. In a pressurized dispenser having a spray discharge nozzle controlled by a discharge valve and connected to a dip tube, the combination of an aqueous vinyl acetate-lower alkyl acrylate copolymer emulsion paint composition free of cellulosic bodying agents and having a pigment suspended therein, the composition having a viscosity of between 10 and 60 seconds measured on the No. 4 Ford cup (20 to 209 cps) at room temperature, and a solids content of 25 to 40% by weight, said dispenser having a relatively waterinsoluble propellant therein occupying the space above the paint composition and characterized by the capacity for discharging such composition in a spray without being materially dissolved in the composition whereby the discharged spray is substantially devoid of foaming, said propellant comprised predominantly of gaseous nitrogen under pressure.

4,056,501

CATIONIC STRUCTURED-PARTICLE LATEXES

Dale S. Gibbs, Midland, Mich.; Earl H. Wagener, Concord, Calif., and Ritchie A. Wessling, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 21, 1975, Ser. No. 569,723

Int. Cl.[2] C08L *9/08*

U.S. Cl. 260—29.6 SQ 19 Claims

1. A method for preparing a cationic structured-particle latex comprising the steps of reacting at a temperature from about 0° to about 80° C a water-stable, nonionic nucleophile which is capable of diffusing through aqueous media with a latex of copolymer particles having activated halogens bound to a thin layer of the copolymer at or near the particle surface; said nucleophile having a hetero atom as a center of nucleophilicity wherein each covalent bond of said hetero atom is to a carbon atom; said activated-halogens being present in an amount from about 0.01 to about 3.0 milliequivalents per gram of copolymer in the latex, with the proviso that the amount of activated-halogen bound to the thin layer at or near the particle surface is in the range of from about 0.4 to about 3.0 milliequivalents for each gram of polymer in the thin layer, whereby

pH independent cationic groups are chemically bound to the particles at or near the particle surface.

4,056,502

ABSORBENT ARTICLES MADE FROM CARBOXYLIC POLYELECTROLYTE SOLUTIONS CONTAINING BIS-OXAZOLINE CROSSLINKER AND METHODS FOR THEIR PREPARATION

James R. Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1974, Ser. No. 494,440

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] C08F *20/06*

U.S. Cl. 260—29.6 N 13 Claims

1. A solution useful to form water swellable articles of a carboxylic synthetic polyelectrolyte which comprises

1. a solvent consisting of water, or a mixture thereof with lower alcohols,
2. about 5 to about 60% by weight based on the amount of solvent of a carboxylic polyelectrolyte or mixtures thereof having free carboxylic acid groups, and
3. 0.05 to 5.0% by weight based on the polyelectrolyte of a bis-oxazoline or bis-imino-oxazolidino crosslinking agent reactive with carboxylic acid groups.

4,056,503

INCORPORATION OF MULTIFUNCTIONAL MONOMERS (PETA, TMPTA, AND HDODA) IN VINYL-ACRYLIC EMULSION POLYMERS

Thomas M. Powanda, Middlesex; Ralph F. Patella, South Plainfield; Joseph A. Vona, Westfield, and Charles A. DeFazio, Berkeley Heights, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,632

Int. Cl.[2] C08L *31/04*

U.S. Cl. 260—29.6 T 9 Claims

1. A latex composition comprised of an emulsion polymer of vinyl acetate with from about 5% to about 50% by weight of alkyl acrylate or methacrylate based on the total weight of vinyl acetate and alkyl acrylate or methacrylate and from about 2% to about 10% by weight, based on the total weight of said polymer, of an acrylic or methacrylic acid ester of a polyol in which at least two hydroxyl groups are esterified.

4,056,504

POLYCARBONATE MOLDING COMPOSITIONS

Manfred Grundmeier; Rudolf Binsack, and Hugo Vernaleken, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 599,259, July 25, 1975, abandoned. This application Jan. 7, 1976, Ser. No. 647,228

Claims priority, application Germany, Aug. 16, 1974, 2439342; July 19, 1975, 2532386

Int. Cl.[2] C08L *67/02, 69/00*

U.S. Cl. 260—37 PC 29 Claims

1. Thermoplastic molding compositions comprising

a. high molecular aromatic polycarbonates based on diphenols,

b. about 10% by weight to 40% by weight based on the polycarbonate + glass fibers, of glass fibers, and

c. about 4% by weight to 0.5% by weight, based on the total mixture, of a polyalkylene glycol terephthalate,

or

a. high molecular aromatic polycarbonates based on diphenols

b. about 10% by weight to 40% by weight, based on the total mixture, of glass fibers and

c. about 10% by weight to 0.5% by weight, based on the total mixture of a polyalkylene glycol isophthalate.

4,056,505

GLASS-REINFORCED THERMOPLASTIC MOULDING COMPOSITIONS

Kenneth John Taylor, and Allan Lord, both of Rochdale, England, assignors to IBA Industrial Products Ltd., England

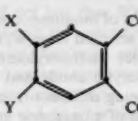
Filed June 2, 1976, Ser. No. 692,143

Claims priority, application United Kingdom, June 7, 1975, 24531/75

Int. Cl.[2] C08K *7/14*

U.S. Cl. 260—42.18 12 Claims

1. A mouldable thermoplastic material comprising from 20% to 90% by weight polypropylene, polyethylene or polyamide as thermoplastic matrix, from 80 to 10% by weight of glass fibre and from 0.05 to 15% by weight based on the total weight of the glass fibre and thermoplastic matrix of an additive capable of coupling with the glass at a temperature within the range from 180° C to 300° C and incapable of forming a homopolymer at said temperature, said additive being selected from the groups consisting of oxalic acid and organic compounds containing the grouping



in which X may be a hydrogen atom, an alkyl group, a carboxyl group, or a group of the formula —CO-R_3, R_3 being selected from alkyl groups, and aromatic groups with or without carbonyl containing substitutents, Y may be a hydrogen atom, an alkyl or a carboxyl group or a group of the formula —COR_4, R_4 being selected from alkyl groups and aromatic groups with or without carbonyl containing substituents, or

X and Y may together constitute an anhydride grouping thus forming a cyclic anhydride,

R_1 and R_2 may be selected from hydroxyl groups, aromatic groups or —COR_1 and —COR_2 may together constitute an anhydride group thus forming a cyclic anhydride.

4,056,506

HOMOGENEOUS POLYEPOXIDE-POLYANHYDRIDE COMPOSITIONS

William J. Heilman, Allison Park, Pa.; Frank C. Peterson, Orange; Mical C. Renz, and Leslie P. Theard, both of Houston, all of Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 590,460, June 26, 1975, which is a continuation-in-part of Ser. No. 501,634, Aug. 29, 1974, abandoned. This application Dec. 8, 1976, Ser. No. 748,597

The portion of the term of this patent subsequent to Apr. 12, 1994, has been disclaimed.

Int. Cl.[2] C08K *7/14;* C08L *63/00, 63/02*

U.S. Cl. 260—42.18 12 Claims

1. A handleable, thermosettable composition which comprises a homogeneous resin mixture of polyanhydride molecules, polyepoxide molecules of an epoxy resin having a 1,2-epoxy equivalent value greater than 1, a saturated monoanhydride, a monoepoxy compound, and from about 0.01 to about 10 weight percent of an anhydride accelerator,

said polyanhydride comprising the addition copolymer of (1) styrene and (2) maleic anhydride in a molar ratio of styrene (1) to maleic anhydride (2) of about 0.5:1 to about 8:1 and (3) a styrene-maleic anhydride copolymer having between two and about 500 repeating units and a styrene to maleic anhydride ratio between about 1:1 and about 10:1;

said saturated monoanhydride selected from phthalic anhydride, hexahydrophthalic anhydride, methyltetrahydrophthalic anhydride, dodecenylsuccinic anhydride, chlorendic anhydride and a mixture of methyl bicyclo(2.2.1)heptane-2,3-dicarboxylic anhydride isomers;

the ratio of anhydride equivalents derived from said maleic anhydride (2) to the total sum of the anhydride equivalents in said homogeneous resin mixture being between about 0.2:1 and about 1:1 and the ratio of anhydride equivalents in said saturated monoanhydride to the anhydride equivalents derived from said styrene-maleic anhydride copolymer (3) being between zero and about 1:1;

the A/E ratio of total anhydride equivalents to total epoxy equivalents in said composition being between about 0.1:1 to about 2.5:1 and the ratio of epoxy equivalents in the epoxy resin to the epoxy equivalents in the monoepoxy compound being at least about 1:1; and

said handleable, thermosettable composition being substantially free of any volatile component.

4,056,507

HINDERED PIPERIDINE CARBOXYLIC ACIDS, METAL SALTS THEREOF AND STABILIZED COMPOSITIONS

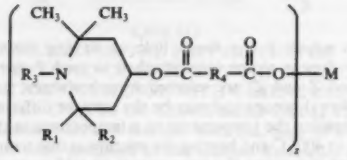
Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 429,232, Dec. 28, 1973, Pat. No. 3,920,661. This application Nov. 19, 1975, Ser. No. 633,201

Int. Cl.[2] C08K *5/34;* **C08D** *211/18;* **C07D** *401/00*

U.S. Cl. 260—45.8 N **26 Claims**

1. A composition of matter comprising a synthetic organic polymer normally subject to ultraviolet deterioration stabilized with 0.005 to 5% of a stabilizer having the formula



wherein

R_1 and R_2 independently of each other are straight- or branched-chain alkyl having from 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 to 4 carbon atoms, propargyl, benzyl, or alkyl substituted benzyl,

R_4 is straight- or branched-chain alkylene having 5 to 8 carbon atoms, or the group $(CH_2)_mY(CH_2)_n$ wherein Y is oxygen or sulfur and m and n independently of each other are an integer of from 1 to 3,

M is hydrogen or a metal selected from the group consisting of barium, nickel, manganese, calcium, zinc, iron, sodium, cobalt, tin and dialkyl tin, and

z has a value of from 1 to 4, the value of z being the same as the available valence of M

said stabilizer bing incorporated into the synthetic organic polymer after polymerization.

4,056,508

DIFFICULTLY INFLAMMABLE POLYESTER MOLDING COMPOSITIONS

Werner Schmidt, St. Augustin; Egon Norbert Petersen, Neunkirchen, and Hermann Richtzenhain, Much-Schwellenbach, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 516,944, Oct. 22, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,071

Claims priority, application Germany, Oct. 27, 1973, 2354001

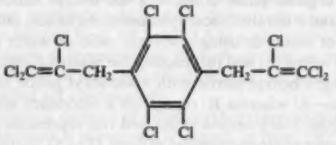
Int. Cl.[2] C08K *3/22, 3/38, 5/03*

U.S. Cl. 260—45.75 B **10 Claims**

1. A flame stabilized molding composition comprising:

1. A polyester which is the condensation product of an aromatic dicarboxylic acid, acid-halide or ester and an aliphatic diol having more than 2 carbon atoms in the chain; and

2. 1,4-bis-(β,γ,γ-trichloroallyl)-2,3,5,6-tetrachlorobenzene, as flameproofing agent, which has the formula:



said 1,4-bis-(β,γ,γ-trichloroallyl)-2,3,5,6-tetrachlorobenzene being present in said composition in an amount of 5–30 weight percent based upon the weight of said polyester.

4,056,509

PREPARATION OF BENZYL CYANIDES

Pieter A. Verbrugge, and Elisabeth W. Uurbanus, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed June 24, 1976, Ser. No. 699,815

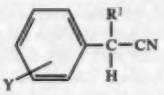
Claims priority, application United Kingdom, July 9, 1975, 28869/75; July 9, 1975, 28900/75

Int. Cl.[2] C07C *120/04, 121/66*

U.S. Cl. 260—465 G **15 Claims**

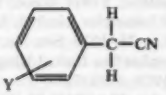
1. A process for the preparation of compounds of the formula

(III)



wherein R^1 represents a secondary alkyl group having from 3 to 6 carbon atoms; and Y represents a hydrogen atom or a halogen atom of atomic number from 9–35, inclusive, which process comprises contacting an organic phase containing a compound of the formula

(II)



and a sec-alkyl halide of the formula

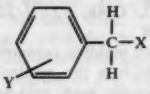
$$Hal - R^1 \qquad IV$$

in which formulas II and IV R^1 and Y have the meanings stated above and Hal represents a halogen atom having an atomic number from 17 to 53, inclusive, with an aqueous phase con-

taining an alkali metal hydroxide or with a solid alkali metal hydroxide in the presence of a tetrahydrocarbylammonium halide, using a molar ratio of sec-alkyl halide of formula IV to compound of formula II of at least 3.

14. A process for the preparation of substituted benzyl nitrile derviatives which comprises (a) reacting a benzyl halide of the formula

(I)



wherein Y represents a hydrogen atom or a halogen atom of atomic number from 9 to 35, inclusive, and X represents a halogen atom of atomic number 17 to 53, inclusive, with sodium cyanide, which reaction is performed in the presence of a liquid organic phase containing the benzyl halide, sodium cyanide and a tetrahydrocarbylammonium halide, either in the absence of water or using a volume ratio of water to benzyl halide of below 0.1 and (b) reacting the resulting organic phase containing a benzyl nitrile with a sec-alkyl halide of the formula Hal—R^1 wherein R^1 represents a secondary alkyl group having from 3 to 6 carbon atoms and Hal represents a halogen atom having an atomic number of from 17 to 53, inclusive, with an aqueous phase containing an alkali metal hydroxide or with a solid alkali metal hydroxide also in the presence of the tetrahydrocarbylammonium halide and using a molar ratio of sec-alkyl halide reactant to benzyl nitrile reactant of at least 3.

4,056,510

AMINE-MODIFIED POLYETHERS

Richard H. Symm, and Byford D. Sheffield, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 23, 1975, Ser. No. 543,219
Int. Cl.[2] C08G *65/24, 65/26, 65/32*
U.S. Cl. 260—47 EP **12 Claims**

1. A water-soluble amine-modified polyether made by reacting an excess of an alkylene polyamine with a halogen-containing polyether prepared by

reacting with 0.1 to 10 mole percent of a poly-1,2-epoxide:

a. a halogen-containing alkylene oxide monomer, or

b. a mixture thereof with a non-halogen-containing alkylene oxide monomer, wherein said mixture contains at least about 50 mole percent of said halogen-containing monomer.

4,056,511

PROCESS FOR PREPARING AROMATIC POLYETHERS

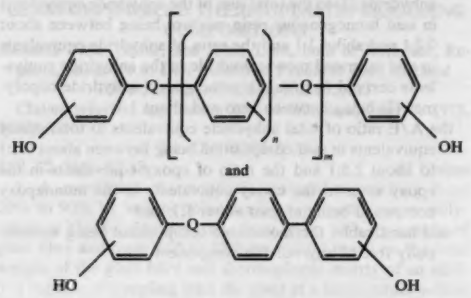
Philip Anthony Staniland, Tewin Wood, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 25, 1976, Ser. No. 670,186
Claims priority, application United Kingdom, Mar. 25, 1975, 12416/75; Feb. 10, 1976, 5169/76
Int. Cl.[2] C08G *65/40*
U.S. Cl. 260—49 **10 Claims**

1. A process for the manufacture of aromatic polyethers whose molecular chains contain phenylene groups, oxygen atoms and ketone and/or sulphone groups comprising

i. heating a monomer mixture consisting essentially of

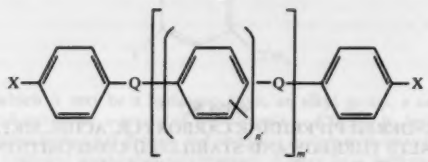
1. 30 to 49.99% molar of at least one di(alkali metal) salt of a bisphenol selected from the group consisting of



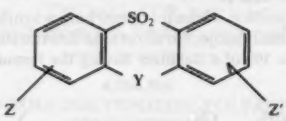
and

at least 95% of the phenolic OH groups being in the para position, Q is —SO_2— or —CO—, m is 0, 1, 2 or 3 and n is 1, 2 or 3, and

2. correspondingly 70 to 50.01% molar of at least one dihalo compound of the formula



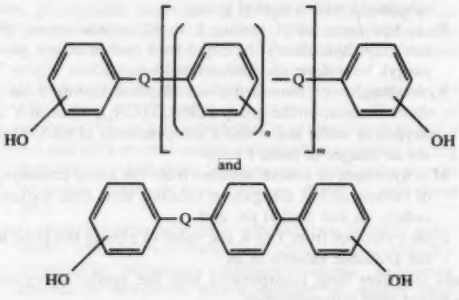
in which X is F, Cl or Br, Q is —SO_2— or —CO—, m' is 0, 1, 2 or 3, and n' is 1, 2 or 3, at a temperature in the range 200° to 250° C in the presence of an aromatic sulphone having the formula



in which Y is a direct link, an oxygen atom or two hydrogen atoms (one attached to each benzene ring) and Z and Z′ are selected from hydrogen atoms and phenyl groups and may be the same or different,

ii. increasing the temperature to a temperature in the range 260 to 400° C and heating the mixture at that temperature,

iii. after increasing the temperature to said temperature in the range 260 to 400° C, adding in finely divided form, at least 0.01 mole, per 100 moles of said monomer mixture, of at least one di(alkali metal) salt of a bisphenol selected from the group consisting of



and

at least 95% of the phenolic OH groups being in the para position, *Q* is —SO_2— or —CO—, *m* is 0, 1, 2 or 3 and *n* is 1, 2 or 3 so as to bring the overall molar ratio of dihalo compound to bisphenate to within the range 51:49 to 50:50 and then

iv. continuing said polymerisation by said heating at the temperature within the range 260° to 400° C.

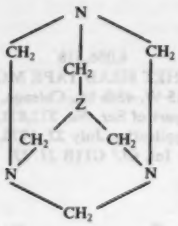
4,056,512

COMPOSITION COMPRISING PHENOLIC RESINS AND CURING AMOUNTS TRIAZA PHOSPHAADAMANTANE COMPOUNDS

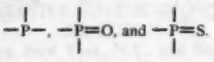
Richard D. Carlson, Grand Island, and Akio Takahashi, Amherst, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Feb. 27, 1976, Ser. No. 661,894
Int. Cl.² C08G 8/28
U.S. Cl. 260—59 R **11 Claims**

1. A curable phenolic molding compound comprising an uncured phenolictype novolak resin and curing amount of a triaza phosphaadamantane compound having the formula:



wherein Z is selected from



4,056,513

PROCESS FOR THE PREPARATION OF TERPENE-PHENOL RESINS BY THREE-STAGE REACTION OF PHENOL WITH CARENE USING FRIEDEL-CRAFTS OR LEWIS ACID CATALYST

Bernard Lahourcade, and Gustave Bonneau, both of Vielle-St Girons, France, assignors to Les Derives Resiniques et Terpeniques, Dax, France

Filed Feb. 20, 1976, Ser. No. 660,024
Claims priority, application France, Mar. 11, 1975, 75.07480
Int. Cl.² C08L 65/00
U.S. Cl. 260—62 **8 Claims**

1. Process for the preparation of terpene-phenol resins by reaction of a carene with a phenol in the presence of an acidic condensation catalyst, comprising:

a. reacting at a temperature of 80°–120° C one molar proportion of a phenol having at least two reactive sites with 0.4–0.6 molar proportion of a carene, in the presence of an acidic condensation catalyst selected from a Lewis acid type catalyst and a Friedel-Crafts type catalyst:

b. reacting at a temperature of 80°–120° C the reaction product from step (a) with 0.4–0.6 molar proportion of said carene, in the presence of said catalyst, said carene being added in steps (a) and (b) at a temperature of 20°–100° C; and

c. subsequently reacting at a temperature of 80°–120° C the product from step (b) with a reactive terpene, the molar ratio of reactive terpene to amount of carene added in step (b) being comprised within the range from 0.5 to 5; steps (a)–(c) being carried out under an inert gaseous atmosphere and in the presence of an aromatic hydrocarbon solvent; thereby obtaining a terpene-phenol resin of clear stable color having a Ring and Ball melting point range of 95°–98° C.

4,056,514

CONTINUOUS MANUFACTURE OF POLYBUTYLENE TEREPHTHALATES

Hugo Strehler, Frankenthal; Ludwig Beer, Ludwigshafen; Eduard Heil, Limburgerhof; Friedrich Urbanek, Schifferstadt, and Hermann Fischer, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Rheinland/Pfalz, Germany

Filed Mar. 18, 1976, Ser. No. 668,284
Int. Cl.² C08G 63/16
U.S. Cl. 260—75 R **9 Claims**

1. A process for the continuous manufacture of linear, high molecular weight polybutylene terephthalates, wherein

a. dimethyl terephthalate is reacted with 1,4-butanediol, if desired in the presence of up to 40 mole% of further starting materials which form linear polyesters, in the molar ratio of from 1:1.2 to 1:1.5 in a plurality of successive stages at temperatures rising from 160° to 230° C in the presence of trans-esterification catalysts, and methanol is distilled off continuously.

b. the resulting mixture of dihydroxybutyl terephthalate and its oligomers is subsequently passed, at from 230° to 270° C and from 20 to 2 mm Hg, upward through a bundle of stationary heated tubes, and the resulting mixture of vapor and liquid is passed through a hold tank located immediately above the tube ends, the volume of the hold tank being at least ¼ and at most 2.5 times the volume of the tube bundle and the mean residence time in the tube bundle and hold tank together being from 10 to 60 minutes, most of the amount of heat required to heat the reaction mixture and vaporize the volatile constituents of the reaction mixture being supplied to the reaction mixture in the tubes, and the mixing of the reaction mixture being effected predominantly by the vapor bubbles rising from the tubes, and

c. the precondensate thus obtained is polycondensed at from 240° to 260° C and from 0.1 to 2 mm Hg, with continuous formation of thin films.

4,056,515

CONTINUOUS REACTION FOR PREPARATION OF ARYLENE SULFIDE POLYMER

Fernando C. Vidaurri, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1976, Ser. No. 671,774
Int. Cl.² C08G 75/14, 75/16
U.S. Cl. 260—79.1 **4 Claims**

1. A continuous process using a plurality of agitated reaction vessels connected in series for producing arylene sulfide polymer by contacting, in an organic amide, a dihalo aromatic compound with a suitable sulfur source to produce a particulate, polymeric product, said method comprising:

a. introducing the reactants into a first reaction zone maintained at substantially liquid-full conditions at a temperature in the range of about 260° C to about 310° C suitable to initiate a polymerization reaction thereby providing a polymerization reaction pressure sufficient to drive the reaction mass through a series of reaction zones;

b. passing reactants and polymerization product from said first reaction zone into a second, substantially liquid-full reaction zone maintained at a polymerization temperature said temperature in the range of about 5° C to about 25° C lower than the temperature of said first zone and a pressure in the range of about 0.5 Kg/cm² to about 2 Kg/cm² lower than the pressure in said first zone;

c. passing partially polymerized reactants and polymerization product from said second reaction zone into a third reaction zone maintained at a polymerization temperature

in the range of about 5° C to about 25° C lower than said second reaction zone and a pressure in the range of about 0.5 Kg/cm^2 to about 2 Kg/cm^2 lower than the pressure in said second zone;

d. passing the effluent from said third reaction zone into a fourth zone having a vapor space above a controlled liquid level wherein the pressure is in the range of about 0.5 Kg/cm^2 to about 2 Kg/cm^2 lower than in the third zone and wherein the temperature is increased to exceed the temperature of said second reaction zone sufficiently to evaporate a portion of the water and organic amide content of the effluent; and

e. subjecting the reaction mixture from the fourth reaction zone to reduced pressure thereby flash evaporating the liquid portion to recover a polymeric, particulate product and a vapor.

4,056,516

MODACRYL FILAMENTS AND FIBERS AND PROCESS FOR THEIR MANUFACTURE

Ernst-August Albers, Bad Soden, Taunus; Walter Fester, Konigstein, Taunus, and Bernd Sassenrath, Niedernhausen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 318,268, Dec. 26, 1972, abandoned. This application Feb. 25, 1976, Ser. No. 661,116

Claims priority, application Germany, Dec. 28, 1971, 2164917

Int. Cl.² C08F *28/00*

U.S. Cl. 260—79.3 M **5 Claims**

1. A process for the manufacture of modacryl filaments and fibers from an acetone-insoluble copolymer of acrylonitrile, 20 to 45 weight percent of vinylidene chloride and up to 11.5 weight percent of further copolymerizable compounds, said copolymer having a K value of from about 60 to about 90, which comprises dissolving the copolymer in a mixture of a solvent for the polymer and a non-solvent for the polymer to form a spinning solution, the amount of non-solvent being from about 30 to 80% of the amount of non-solvent which would cause gelation of the spinning solution at the spinning temperature, forcing the spinning solution so obtained through nozzles into the first of at least three series-connected coagulation baths containing mixtures of said polymer solvent and said polymer non-solvent, the polymer solvent concentration in the first coagulation bath being from 30 to 70% by weight of said bath and being gradually reduced in successive coagulation baths, the polymer solvent concentration in the first coagulation bath being about 1.2 to 2.0 times that of the second coagulation bath, the polymer solvent concentration in each coagulation bath subsequent to the second bath being reduced by a factor of about 1.2 to 3 in each such subsequent bath, the temperatures of the first and second coagulation baths being from 0° to 70° C. and those of the third and the following baths from 20° to 90° C., drawing the spinning tows obtained to a multiple of their length in at least one of these baths, and, after removal of the solvent as completely as possible, subjecting said drawn tows to at least one further drawing.

4,056,517

MODACRYL FILAMENTS AND FIBERS AND PROCESS FOR THEIR MANUFACTURE

Ernst-August Albers, Bad Soden, Taunus, and Bernd Sassenrath, Niedernhausen, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 318,269, Dec. 26, 1972, abandoned. This application Feb. 25, 1976, Ser. No. 661,117

Claims priority, application Germany, Dec. 28, 1971, 2164918

Int. Cl.² C08F *28/00*

U.S. Cl. 260—79.3 M **5 Claims**

1. A process for the manufacture of modacryl filaments and fibers from an acetone-insoluble copolymer of acrylonitrile, 20 to 45 weight percent of vinylidene chloride and up to 11.5 weight percent of at least one other compound copolymerizable therewith, said copolymer having a K value of about 95 to 120, which comprises dissolving said copolymer in a solvent to form a spinning solution, forcing the spinning solution so obtained through nozzles into the first of at least three series-connected coagulation baths containing mixtures of the polymer solvent and at least one non-solvent for the polymer, the polymer solvent concentration in the first coagulation bath being from 30% to 70% by weight of said bath and being gradually reduced in successive coagulation baths, the polymer solvent concentration in the first coagulation bath being about 1.2 to 2.0 times that of the second coagulation bath, the polymer solvent concentration in each coagulation bath subsequent to the second bath being reduced by a factor of 1.2 to 3 in each such subsequent bath, the temperatures of the first and second coagulation baths being from 0° to 70° C., those of the third and the following baths being from 20° to 90° C., drawing the spinning tows obtained to a multiple of their length in at least one of these baths and, after removal of the solvent as completely as possible, subjecting said drawn tows to at least one further drawing.

4,056,518

RATCHET HEAD TAPE MOVER

Sidney Milovac, 4215 W. 45th St., Chicago, Ill. 60632

Continuation-in-part of Ser. No. 372,871, June 22, 1973, abandoned. This application July 22, 1975, Ser. No. 598,503

Int. Cl.² G11B *21/12*

U.S. Cl. 360—106 **3 Claims**

1. In a magnetic tape system including a magnetic tape head with tape gaps for accessing a magnetic tape having a plurality of tape tracks, a movable tape head support member mounted for movement to be aligned in relation to each of said plurality of tape tracks, plurality of tape tracks, a tape head elevation adjustment arrangement comprising:

wheel means, said wheel means supported for rotation adjacent said tape head support member; said wheel means having a plurality of radially projecting extensions, said radially projecting extensions separated consecutively by an integral multiple of the distance between adjacent tape tracks;

slot means, said slot means rigidly connected to said tape head support member, said slot means defining a slot for receiving said radially projecting extensions of said wheel means and assuming an elevation corresponding to the elevation of the radially projecting extension received.

4,056,519

SUBSTRATE FOR ASSAY OF PLASMIN

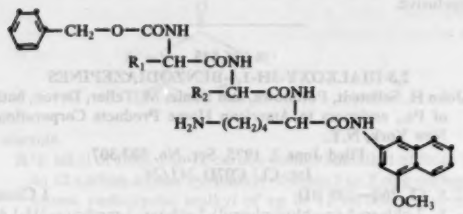
Jesse L. Bobbitt, and Edward L. Smithwick, Jr., both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 10, 1976, Ser. No. 685,193

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 R **5 Claims**

1. A tripeptidyl-4-methoxy-2-naphthylamide having the formula,



in which R_1 and R_2 independently are hydrogen, alkyl, hydroxyalkyl, mercaptoalkyl, methylthioalkyl, benzyl, or hydroxybenzyl, with the proviso that at least one of R_1 and R_2 must be other than benzyl or hydroxybenzyl; and the acid addition salts thereof in which the acid is inorganic or C_1–C_2 carboxylic.

4,056,520

CLINICALLY ACTIVE BOVINE GROWTH HORMONE FRACTION

Martin Sonenberg, New York, N.Y., and Nobuyuki Yamasaki, Matsuyama, Japan, assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 240,301, March 31, 1972, Pat. No. 3,904,753, which is a division of Ser. No. 13,162, Feb. 20, 1970, Pat. No. 3,664,925. This application May 2, 1975, Ser. No. 573,902

Int. Cl.[2] **C07C** *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **1 Claim**

1. A polypeptide derivable from and being a fraction or moiety of bovine growth hormone and useful for the treatment of pituitary dwarfism, said polypeptide having a molecular weight of about 5000, an amino acid content or chain length of about 38 amino acids, said polypeptide recoverable by gel filtration in the present of 50% having valine as the amino terminal amino acid and arginine as the carboxyl terminal amino acid and having the amino acid analysis:

lysine	2.0
arginine	2.8
asparatic acid and asparagine	3.8
threonine	2.6
serine	1.9
glutamic acid and/or glutamine	4.9
proline	0.9
glycine	2.9
alanine	1.0
valine	3.0
methionine	1.0
isoleucine	0.9
leucine	5.1
tyrosine	1.0
phenylalanine	1.8

4,056,521

PENAM AND CEPHAM DERIVATIVES AND PREPARATION THEREOF

Takashi Kamiya, Suita; Tsutomu Teraji; Masashi Hashimoto, both of Toyonaka; Osamu Nakaguti, Osaka, and Teruo Oku, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

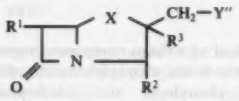
Division of Ser. No. 407,962, Oct. 19, 1973, Pat. No. 3,954,732. This application Dec. 1, 1976, Ser. No. 648,492

Claims priority, application Japan, Dec. 20, 1972, 48-128658; Dec. 20, 1972, 48-128659; Dec. 20, 1972, 48-128660; Dec. 21, 1972, 48-128902; Dec. 22, 1972, 48-2270; Dec. 23, 1972, 48-1198; Dec. 23, 1972, 48-1201; Aug. 1, 1973, 47-87108

Int. Cl.[2] **C07D** *499/44*

U.S. Cl. 260—239.1 **6 Claims**

1. A compound of the general formula:



wherein R^1 is a conventional, pharmaceutically acceptable acylamino, R^2 is carboxy or a conventionally protected carboxy, X is —S— or

R^3 is lower alkyl and Y″ is arylamino.

4,056,522

AZO COMPOUNDS DERIVING FROM 3-AMINO-4-LOWER CARBOALKOXY-BENZOIC ACID-4′-PHENOXY ANILIDES AND 2-HYDROXY-3-NAPHTHOIC ACID-4′-BENZOYLAMINO ANILIDES

Klaus Hunger, Kelkheim, Taunus, and Friedrich Wilhelm Weingarten, Liederbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

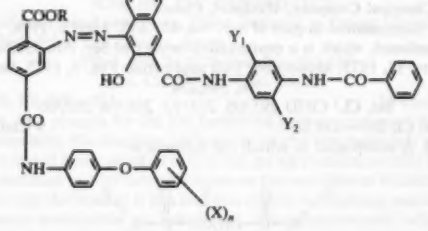
Filed May 13, 1976, Ser. No. 686,031

Claims priority, application Germany, May 15, 1975, 2521655

Int. Cl.[2] **C09B** *29/20*

U.S. Cl. 260—203 **10 Claims**

1. A compound of the formula



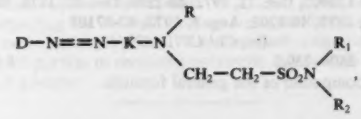
in which R is methyl or ethyl, X stands for equal or different halogen atoms, Y_1 and Y_2, which are equal or different, are hydrogen, chlorine, bromine, methyl, ethyl, methoxy or ethoxy and *n* is zero or an integer from 1 to 4.

4,056,523
WATER-INSOLUBLE AZO DYESTUFFS

Peter Mischke, Neuenhain, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 8, 1975, Ser. No. 638,909
Claims priority, application Germany, Dec. 9, 1974, 2458195
Int. Cl.² C09B 46/00, 29/00
U.S. Cl. 260—205 9 Claims

1. Novel azo dyestuffs-being water-soluble only in traces - of the formula



in which

D as the radical of a diazo component represents nitrophenylene, carbo-lower alkoxy-phenylene, dinitrophenylene, nitro-cyano-phenylene, nitro-chloro-phenylene, nitro-bromo-phenylene, nitro-lower alkylsulfonyl-phenylene, nitro-carbo-lower alkoxy-phenylene, di(cyano)phenylene, trifluoro- lower alkylsulfonyl-phenylene, dichlorophenylene, chloro- lower alkoxy-phenylene,

chloro- lower alkylsulfonyl-phenylene, di(nitro)-bromophenylene, trichlorophenylene, dichloro-nitro-phenylene, dinitro-chloro-phenylene, phenylazo-phenylene, di(carbo-lower alkoxy)phenylene,

nitro- lower alkyl-phenylene, nitro-trifluoromethyl-phenylene or nitro-bromo-cyano-phenylene,

K represents phenylene, lower alkylphenylene, lower alkoxyphenylene, chlorophenylene acetylamino-phenylene, benzoylamino-phenylene, lower alkylsulfonylamino-phenylene, formylamino-phenylene, chloroacetylamino-phenylene, carbo-lower alkoxyamino-phenylene, lower alkyl-lower alkoxyphenylene, lower alkyl-acetylamino-phenylene, di(lower alkyl)phenylene, dichlorophenylene, lower alkoxy-lower alkylene-CO-NH-phenylene, lower alkoxy-acetylamino-phenylene or hydroxynaphthylene,

R represents hydrogen, lower alkyl, lower alkylene-O-CO-lower alkyl, lower alkylene-COO-lower alkyl, cyano-lower alkyl, chloro-lower alkyl, benzyl or cyclohexyl,

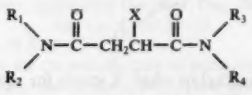
R_1, represents hydrogen, alkyl of from 3 to about 14 carbon atoms, cyanoethyl, hydroxyethyl, acetoxyethyl or benzyl, and R_2 represents alkyl of from 4 to about 14 carbon atoms, benzyl, phenylethyl, cyclohexyl, phenyl, methylphenyl, ethylphenyl, methoxyphenyl, ethoxyphenyl, nitrophenyl, chlorophenyl or bromophenyl.

4,056,524
BIS-SUBSTITUTED SUCCINAMIDES AND THEIR UTILITY AS HERBICIDES

Francis H. Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 459,438, April 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 410,641, Nov. 12, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,234
Int. Cl.² C07D 295/06, 203/12, 205/04, 207/06
U.S. Cl. 260—239 BF 9 Claims

1. A compound in which the formula is



in which X is chlorine or bromine; R_1 and R_2 taken together are alkylene having from 2 to 8 carbon atoms, inclusive; R_3 and R_4 taken together are alkylene having from 2 to 8 carbon atoms, inclusive.

4,056,525
2,3-DIALKOXY-3H-1,4-BENZODIAZEPINES

John H. Sellstedt, Pottstown, and Daniel M. Teller, Devon, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed June 2, 1975, Ser. No. 583,307
Int. Cl.² C07D 243/24
U.S. Cl. 260—239 BD 1 Claim

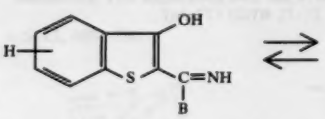
1. 7-chloro-5-(o-chlorophenyl)-2-ethoxy-3-methoxy-3H-1,4-benzodiazepine.

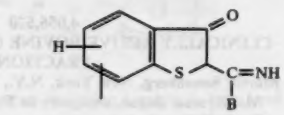
4,056,526
BENZO(b)THIOPHENE DERIVATIVES

Peter Johannes Stoss, Wildtal; Manfred Franz Reinhold Herrmann, Gundelfingen, and Gerhard Satzinger, Denzlingen, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

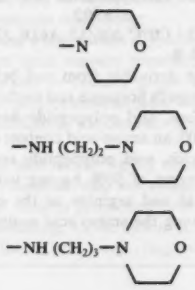
Division of Ser. No. 566,469, April 9, 1975, Pat. No. 3,971,814, which is a division of Ser. No. 419,305, Nov. 27, 1973, Pat. No. 3,907,826. This application May 28, 1976, Ser. No. 691,109
Claims priority, application Germany, Nov. 27, 1972, 2225803
Int. Cl.² C07D 413/02
U.S. Cl. 544—146 4 Claims

1. Benzo(b)thiophene compounds of the formula:





wherein B is selected from the group consisting of:

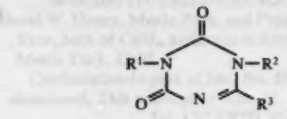


4,056,527
TETRAHYDRO-1,3,5-TRIAZINE-2,6-DIONES

Hans Georg Schlee, Cologne; Klaus Sasse, Schildgen, and Ludwig Eue, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 18, 1973, Ser. No. 407,693
Claims priority, application Germany, Nov. 6, 1972, 2254200
Int. Cl.² C07D 251/16, 251/42; A01N 9/22
U.S. Cl. 544—194 19 Claims

1. 1 (3-times amended) Tetrahydro-1,3,5-triazine-2,6-dione compound of the formula



(I)

wherein

R^1 is alkyl of from 1 to 12 carbon atoms, haloalkyl of from 1 to 12 carbon atoms, cycloalkyl of from 5 to 7 ring carbon atoms, carbocyclic aralkyl of up to 12 carbon atoms or carbocyclic aryl of up to 10 carbon atoms, which cycloalkyl, carbocyclic aralkyl or carbocyclic aryl may be substituted with at least one of halogen, alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms and trifluoromethyl,

R^2 is alkoxy or alkanoyloxy of from 1 to 4 carbon atoms, cycloalkyl of from 5 to 7 ring carbon atoms, carbocyclic aralkyl of up to 12 carbon atoms or carbocyclic aryl of up to 10 carbon atoms; or

R^2 is $—NR^4R^5$ wherein R^4 and R^5 individually represent hydrogen, alkyl of up to 4 carbon atoms or alkanoyl of up to 4 carbon atoms; or

R^2 is $—NR^4R^5$ wherein R^4 and R^5 together represent alkylidene, of up to 3 carbon atoms, optionally substituted with at least one of carbocyclic aryl, haloaryl, alkoxyaryl and nitroaryl of up to 10 carbon atoms;

R^3 is hydrogen, halogen, alkyl of up to 10 carbon atoms, haloalkyl of up to 10 carbon atoms or carbocyclic aryloxy of up to 10 carbon atoms; or

R^3 is $—N—R^6R^7$ wherein R^6 and R^7 individually are hydrogen, alkyl of up to 4 carbon atoms, carbocyclic aralkyl of up to 7 carbon atoms, hydroxyl, amino, or methoxy; or

R^3 is alkoxy or alkylthio of up to 4 carbon atoms.

4,056,528

DISPERSE DYES

Hansrudolf Schwander, Riehen; Kurt Burdeska, Basel, and Christian Zickendraht, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

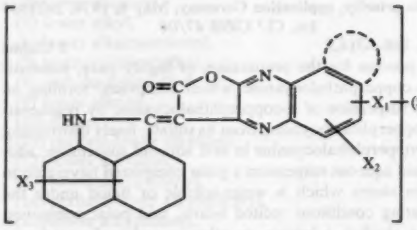
Filed Feb. 13, 1976, Ser. No. 657,771

Claims priority, application Switzerland, Feb. 21, 1975, 2239/75

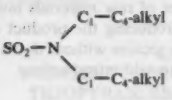
Int. Cl.² C07D *491/04*

U.S. Cl. 260—250 Q **8 Claims**

1. A dyestuff of the formula

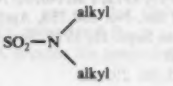


wherein X_1 represents fluorine, bromine, chlorine or hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl, phenoxy, thiophenoxy or C_1–C_4-alkyl sulphonyl, C_1–C_4-alkylthio, each of which is unsubstituted or substituted by C_1–C_4-alkoxy, hydroxy, cyano, bromine, chloride, carbo-C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkoxy, C_1–C_4-alkylcarbonyloxy, chloro-C_1–C_4-alkylcarbonyloxy or C_1–C_4-alkoxy-carbonyloxy, fluorine, bromine, chlorine, COOR, in which R represents C_1–C_4-alkyl or C_1–C_4-alkyl substituted by C_1–C_4-alkoxy, hydroxy, cyano, C_1–C_4-alkylcarbonyloxy, chlorine or bromine,—SO_2NH-C_1–C_4-alkyl and



(wherein the C_1–C_4-alkyl is unsubstituted or substituted by hydroxy, chlorine, bromine, C_1–C_4-alkoxy or phenyl). —SO_2C_1–C_4-alkyl or CN;

X_2 represents methoxy, ethoxy, methyl or hydrogen. X_3 represents hydrogen, alkyl containing up to 4 carbon atoms, chlorine, bromine,



wherein alkyl is substituted or unsubstituted), nitro, or SO_2—R, wherein R represents alkyl or substituted or unsubstituted phenyl, *n* is 0, 1 or 2,

and the dotted ring can represent a fused benzene ring.

4,056,529

DIBENZOPYRIMIDOAZEPINES

Robin Michael Black, Porton, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

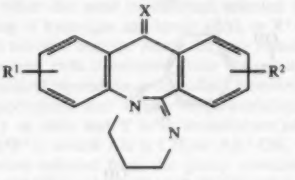
Filed Jan. 8, 1976, Ser. No. 647,376

Claims priority, application United Kingdom, Jan. 16, 1975, 1937/75

Int. Cl.² C07D *487/04, 223/20*; A61K *31/55*

U.S. Cl. 260—251 A **6 Claims**

1. A dibenzopyrimidoazepine selected from the group consisting of compounds having the formula (I):



and the pharmaceutically acceptable acid addition and quaternary ammonium salts thereof, wherein R^1 and R_2 each represent hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl and X represents two hydrogen atoms, an oxo group, an ethylene ketal group, a di-(lower alkyl) ketal group, or an oximino group.

4,056,530

PROCESS OF SEMICONTINUOUSLY PRODUCING ANILINE CONDENSED DYES

Yoshihiro Maekawa, Nara, Japan, assignor to Orient Chemical Industries, Ltd., Osaka, Japan

Filed June 7, 1976, Ser. No. 693,619

Int. Cl.² C09B *57/00, 59/00*

U.S. Cl. 260—267 **16 Claims**

1. In a process for the production of aniline condensed dyes comprising the reacting, by heating, of the raw materials aniline and at least one of nitrobenzene, an alkylaniline, an alkylnitrobenzene or diazoaminobenzene in the presence of a catalyst wherein the heating is in a reaction system comprising reaction vessels susceptible to heat shock, the improvement which comprises:

i. dividing said reaction system into at least two reaction sections, each section comprising one or more reaction vessels, the second section being maintained at a higher temperature than the first section; and

ii. reacting said raw materials by secessively and semicontinuously introducing batches of raw materials into said first reaction section and introducing the product therefrom into the second reaction section without down times in the reaction vessels prior to said introductions.

4,056,531

POLYMONOOLEFIN QUATERNARY AMMONIUM SALTS OF TRIETHYLENEDIAMINE

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 395,221, Sept. 7, 1973, abandoned, which is a division of Ser. No. 255,223, May 19, 1972, Pat. No. 3,778,371, which is a continuation-in-part of Ser. No. 138,758, April 29, 1971, abandoned. This application Sept. 15, 1975, Ser. No. 613,369

Int. Cl.[2] C07D *295/00, 295/22*

U.S. Cl. 260—268 PL **9 Claims**

1. A high molecular weight quaternary ammonium salt of triethylenediamine having one or two palymonoolefin groups having an average molecular weight of from about 350 to about 3000 bonded only to a quaternary ammonium nitrogen atom of said triethylenediamine.

4,056,532

ALPHA-ARYL-2-PYRIDINEETHANOL 1-OXIDES AND ALPHA-PYRIDINYL-2-PYRIDINEETHANOL 1-OXIDES

David T. Connor, Parsippany; Patricia A. Young, Madison, and Maximillian von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

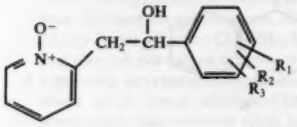
Filed June 24, 1976, Ser. No. 699,278

Int. Cl.[2] C07D *213/89*

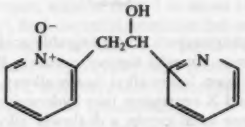
U.S. Cl. 260—296 R **10 Claims**

1. A compound of the formula 1 or II:

I



II



wherein R_1 is hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy, benzyloxy, lower alkanoyloxy, ortho-amino or ortho-lower alkylamino; R_2 and R_3 are each hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy, benzyloxy or lower alkanoyloxy, and the pharmaceutically acceptable acid addition salts thereof.

4,056,533

PYRAZOL-5-ONES

Eike Möller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

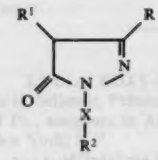
Division of Ser. No. 461,285, April 15, 1974, Pat. No. 3,952,008. This application Nov. 14, 1975, Ser. No. 631,946

Claims priority, application Germany, Apr. 17, 1973, 2319279; Dec. 19, 1973, 2363138

Int. Cl.[2] C07D *231/52;* A61K *31/415*

U.S. Cl. 548—360 **13 Claims**

1. A compound of the formula



I

or a pharmaceutically acceptable, nontoxic salt thereof, wherein

R is amino;

R^1 is hydrogen, lower alkyl or lower alkenyl ;

X is

a. ethylene, ethylene wherein 1 hydrogen atom on 1 of the carbon atoms is substituted by alkyl of 1 to 4 carbon atoms or ethylene wherein 1 hydrogen atom on each of the two carbon atoms is substututed by alkyl of 1 to 4 carbon atoms; or

b. propenyl, propenyl wherein 1 hydrogen atom on one, two or three of the carbon atoms is substituted by alkyl of 1 to 4 carbon atoms, said propenyl being linked to the N^1 atom of the pyrazole ring via its methylene moiety;

R^2 is aryl of 6 to 10 carbon atoms unsubstituted or substututed by:

a. 1 or 2 of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms and lower alkoxy;

b. cycloalkyl of 5, 6 or 7 carbon atoms or cycloalkenyl of 5, 6 or 7 carbon atoms;

c. nitro; or

d. nitro, and 1 or 2 of the same or different substituents selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, halogen and trifluoromethyl.

4,056,534

PROCESS FOR PREPARING COPPER PHTHALOCYANINE PIGMENTS OF THE α-MODIFICATION

Siegfried Schiessler, Frankfurt am Main; Ernst Spietschka, Oberauroff, Taunus, and Hans-Gerd Elinkmann, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 5, 1975, Ser. No. 574,759

Claims priority, application Germany, May 6, 1974, 2421804

Int. Cl.[2] C09B *47/04*

U.S. Cl. 260—314.5 **3 Claims**

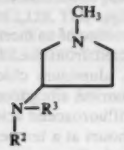
1. A process for the preparation of highly pure, unsubstituted α-copperphthalocyanine which comprises: forming an aqueous suspension of α-copperphthalocyanine by regenerating α-copperphthalocyanine from its sulfate; finely distributing said α-copperphthalocyanine in said aqueous suspension; adding to said aqueous suspension a polar compound having up to 8 carbon atoms which is water-soluble or liquid under the aftertreating conditions recited below, said polar compound being an alcohol, a ketone, an ether, a carboxylic acid or a functional derivative of a carboxylic acid selected from the group consisting of esters, nitriles, amides, lactones and lactams and further being aliphatic, cycloaliphatic or saturated heterocyclic compound containing one or two identical or different hetero atoms selected from oxygen, sulfur and nitrogen; finely distributing said α-copperphthalocyanine in said aqueous medium containing said polar compound at a temperature of 15° to 80° C and continuing said fine distribution until the difference in the intensity between the maxima at 12.1 and 13 A and the minimum at 12.6 A in the Xray diagram of the product is from 1:10 to 10:4.

4,056,535
N-SUBSTITUTED 3-AMINOPYRROLIDINES

David W. Henry, Menlo Park, and Priscilla A. Sturm, Mountain View, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Continuation-in-part of Ser. No. 594,511, July 9, 1975, abandoned. This application Apr. 23, 1976, Ser. No. 679,718
Int. Cl.[2] C07D *207/14*
U.S. Cl. 260—326.2 3 Claims

1. The compounds having the structure



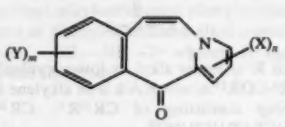
wherein R^2 may be $-CON(C_2H_5)_2$ and R^3 be —H, or R^2 may be $-CO_2C_2H_5$ and R^3 be $-CH_3$, and the pharmaceutically acceptable acid addition salts thereof.

4,056,536
PYRROLO[2,1-b][3]BENZAZEPINES

Joseph G. Atkinson, Montreal; Patrice C. Belanger, Dollard des Ormeaux; Clarence S. Rooney, Beaconsfield, all of Canada, and Susan F. Britcher, Norristown, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 29, 1976, Ser. No. 700,921
Int. Cl.[2] C07D *487/04*
U.S. Cl. 260—326.5 B 7 Claims

1. A compound of structural formula:



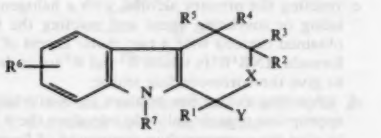
wherein
n is [3,2,] **1**, or **0** (X is hydrogen);
m is [4, 3, 2,] **1** or **0** (Y is hydrogen); and
X and Y are independently selected from
(1) hydrogen,
(2) halo,
(3) formyl,
(4) lower alkanoyl,
(5) lower alkyl,
(6) lower alkoxycarbonyl,
(7) hydroxy-lower alkyl,
(8) perhalo-lower alkyl,
(9) lower alkoxy,
(10) cyano,
(11) perhalo-lower alkylthio,
(12) lower alkylthio,
(13) lower alkylsulfonyl,
(14) perhalo-lower alkylsulfonyl,
(15) lower alkylsulfinyl,
(16) perhalo-alkylsulfinyl,
(17) amino,
(18) lower alkanoylamino,
(19) lower alkylamino,
(20) di(lower alkyl)amino,
(21) hydroxy,
(22) N-lower alkylcarbamoyl,
(23) N,N-di(lower alkyl)carbamoyl,
(24) nitro,
(25) di(lower alkyl)sulfamoyl,
(26) lower alkoxycarbonylamino,
(27) N-loweralkyl-carbamoyloxy,
(28) carboxy, and
(29) carbamoyl.

4,056,537
PROCESS FOR MAKING PYRANO- AND THIOPYRANOINDOLE DERIVATIVES

Christopher A. Demerson, St. Laurent; Leslie G. Humber, Dollard des Ormeaux; Andre A. Asselin, Lemoyne; Ivo Jirkovsky, Montreal, and Thomas A. Dobson, Dollard des Ormeaux, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

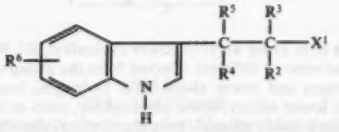
Division of Ser. No. 507,085, Sept. 18, 1974, abandoned, which is a division of Ser. No. 217,627, Jan. 13, 1972, Pat. No. 3,852,285. This application Oct. 18, 1976, Ser. No. 733,829
Int. Cl.[2] C07D *491/04*
U.S. Cl. 260—326.5 B 5 Claims

1. A process for preparing a compound of formula



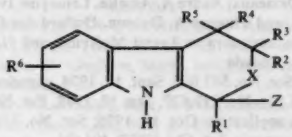
in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is lower alkyl, lower alkenyl, propargyl, phenyl (lower) alkyl or an amino (lower)alkyl radical or formula —Alk-NR^8R^9 wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 and R^9 together with the nitrogen atom to which they are joined from a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl piperidino, morpholino, piperazino, 4-(lower)alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl; X is oxy or thio; and Y is an amino(lower)alkyl of formula Alk-NR^8R^9 in which Alk is CH_2 or Alk^1-CH_2 wherein Alk^1 is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ wherein R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, and R^{15} are as defined herein, which comprises:

a. reacting in the presence of an inert organic solvent and an acid catalyst selected from the class consisting of p-toluenesulfonic acid, aluminum chloride, phosphorus pentoxide, boron trifluoride, zinc chloride, hydrochloric acid, perchloric acid, trifluoroacetic acid and sulfuric acid from 10 minutes to 60 hours at a temperature within the range from 20° C to the boiling point of the reaction mixture substantially equal molar equivalents of a compound of the formula:



in which R^2, R^3, R^4, R^5 and R^6 are as defined herein and X^1 is hydroxy or mercapto, with the compound of formula

in which R^1 is lower alkyl or cyloalkyl and z is selected from the group consisting of CH_2OCOR^{20} and Alk^1-CH_2OCOR^{20} in which R^{20} is hydrogen or lower alkyl and Alk^1 is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14} and R^{15} are hydrogen or lower alkyl; to provide a tricyclic compound of formula

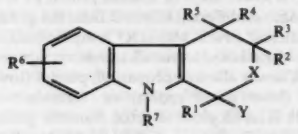


in which R^1, R^2, R^3, R^4, R^5, R^6, X and Z are as defined herein;

b. subjecting the tricyclic compound to hydrolysis to obtain the corresponding primary alcohol;

c. reacting the primary alcohol with a halogenating, mesylating or tosylating agent and reacting the intermediate obtained thereby with a two molar excess of an amine of formula HNR^8R^9 in which R^8 and R^9 are as defined herein to give the corresponding amine;

d. subjecting the amine product to N-alkylation with an appropriate organic halide to introduce the R^7 substituent; to give the corresponding compound of formula



in which R^1, R^2, R^3, R^4, R^5, R^6, R^7, X and Y are as defined herein; and, if desired, forming the acid addition salt thereof with a pharmaceutically acceptable acid.

4,056,538

PROCESS FOR PREPARING PYRANO- AND THIOPYRANOINDOLE DERIVATIVES

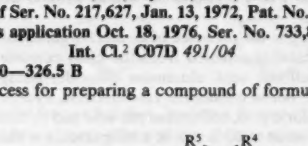
Christopher A. Demerson; Leslie G. Humber, both of Montreal; André A. Asselin, Lemoyne; Ivo Jirkovsky, and Thomas A. Dobson, both of Montreal, all of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Division of Ser. No. 507,085, Sept. 18, 1974, abandoned, which is a division of Ser. No. 217,627, Jan. 13, 1972, Pat. No. 3,852,285. This application Oct. 18, 1976, Ser. No. 733,834

Int. Cl.[2] C07D *491/04*

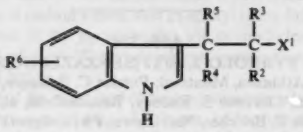
U.S. Cl. 260—326.5 B **10 Claims**

1. A process for preparing a compound of formula



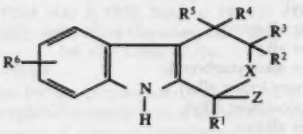
in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is lower alkyl, lower alkenyl, propargyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of formula —Alk—NR^8R^9 wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, piperazino, 4-(lower-)alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl; X is oxy or thio; and Y is an amino(lower)alkyl of formula Alk-NR^8R^8 in which Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are as defined herein, and R^8 is hydrogen or lower alkyl and R^8 is lower alkyl, which comprises:

a. reacting in the presence of an inert organic solvent and an acid catalyst selected from the class consisting of p-toluenesulfonic acid, aluminum chloride, phosphorus pentoxide, boron trifluoride, zinc chloride, hydrochloric acid, perchloric acid, trifluoroacetic acid and sulfuric acid from 10 minutes to 60 hours at a temperature within the range from 20° C to the boiling point of the reaction mixture substantially equal molar equivalents of a compound of the formula:



in which R^2, R^3, R^4, R^5 and R^6 are as defined herein and X^1 is hydroxy or mercapto, with the compound of formula

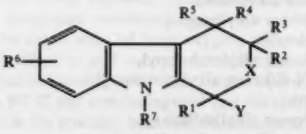
in which R^1 is lower alkyl or lower cycloalkyl and Z is Alk-NR^8-COR^{21} in which Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ in which R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are as defined herein, R^8 is hydrogen or lower alkyl and R^{21} is hydrogen or lower alkyl containing one to five carbon atoms, to provide a tricyclic compound of the formula



in which R^1, R^2, R^3, R^4, R^5, R^6, X and Z are as defined herein;

b. reducing the tricyclic compound with a suitable complex metal hydride to give the corresponding amine;

c. subjecting said amine to N-alkylation with an appropriate organic halide to introduce the R^7 substituent to give the corresponding compound of the formula



in which R^1, R^2, R^3, R^4, R^5, R^6, R^7 and X are as defined

herein, Y is Alk $NR^8CH_2R^{21}$ wherein Alk, R^8 and R^{21} are as defined herein; and, if desired, forming the acid addition salt thereof with a pharmaceutically acceptable acid.

4,056,539

NAPHTHALIDE INDICATOR DYES

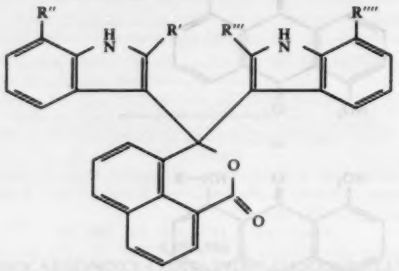
Richard B. Greenwald, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 520,248, Nov. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 204,350, Dec. 2, 1971, Pat. No. 3,862,128. This application Mar. 22, 1976, Ser. No. 669,190

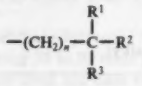
Int. Cl.² C07D *209/18*

U.S. Cl. 260—326.14 R **6 Claims**

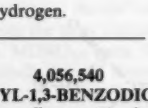
1. An indicator dye having the formula



wherein R′ and R″ each are selected from hydrogen, carboxy, hydroxy, o-hydroxyphenyl, —NH—SO_2—R wherein R is alkyl containing 1 to 20 carbon atoms, aryl selected from phenyl and naphthyl, alkyl-substituted phenyl containing up to 18 carbon atoms or phenyl-substituted alkyl containing up to 18 carbon atoms, —SO_2—NH—R^o wherein R^o has the same meaning as R, and the group



wherein R^1 is —OH, R^2 is hydrogen, alkyl having 1 to 20 carbon atoms, aryl selected from phenyl and naphthyl, alkyl-substituted phenyl having up to 20 carbon atoms or perhalomethyl, R^1 and R^2 when taken together represent =O, R^3 is perhalomethyl, and *n* is an integer O or l, at least one of R′ and R″ being hydrogen and one of R‴ and R⁗ being said group



and the other being hydrogen.

4,056,540

4-PHENYL-1,3-BENZODIOXANS

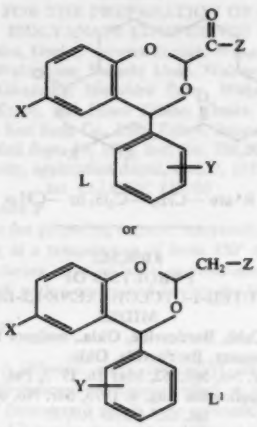
Ronald Leslie Buchanan, Fayetteville; Richard Anthony Partyka, Liverpool, and Robert Ted Standridge, Cazenovia, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 434,463, Jan. 1, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 604,979

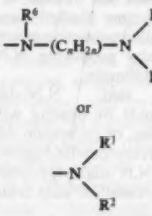
Int. Cl.² C07D *319/08, 405/06, 405/12*

U.S. Cl. 260—340.3 **20 Claims**

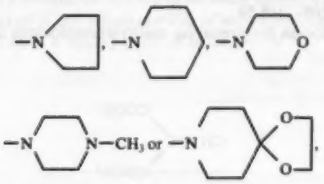
1. The compound having the formula



in which X and Y are alike or different and are H, F, Cl, Br, CF_3 or Nitro, Z is a radical having the formula



in which R^6 is H, (lower) alkyl or phenyl, R^1 and R^2 are alike or different and each is H, lower alkyl, cycloloweralkyl or when taken together with the nitrogen a heterocyclic ring having the formula



and *n* is an integer of 1 to 4 inclusive;
or a pharmaceutically acceptable acid addition salt thereof.

4,056,541

KETOLACTONES

Werner Hoffman, Neuhofen; Norbert Mueller, Mutterstadt, and Karl von Fraunberg, Bobenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

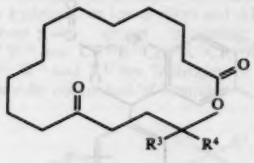
Filed Mar. 1, 1976, Ser. No. 662,579

Claims priority, application Germany, Mar. 15, 1975, 2511410

Int. Cl.² C07D *313/00*

U.S. Cl. 260—343 **3 Claims**

1. The ketolactones of the general formula I



where R^3 and R^4 are $-CH_3$, $-C_2H_5$ or $-CH=CH_2$.

4,056,542
PYROLYSIS OF N-SUBSTITUTED-1-CYCLOHEXENE-1,2-DICARBOXIMIDES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 360,962, May 16, 1973, Pat. No. 3,932,457. This application Aug. 8, 1975, Ser. No. 603,221
Int. Cl.² C07D *307/89*
U.S. Cl. 260—346.3 **7 Claims**

1. A process of preparing pyromellitic anhydride which comprises the steps of:

reacting under pyrolysis conditions at elevated temperatures in the range of about 500° to 1000° C. at reduced pressure and short contact time N-alkyl-1-cyclohexene-1,2-dicarboximide and N-alkylmaleimide in substantially equimolar relationship thereby producing N,N′-dialkyl-3,4,5,6-tetrahydropyromellitdiimide,

dehydrogenating said N,N′-dialkyl-3,4,5,6-tetrahydropyromellitdiimide by heating with sulfur, or with a palladium, platinum, or ruthenium dehydrogenation catalyst to N,N′-dialkylpyromellitdiimide, and

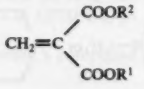
hydrolyzing said N,N′-dialkylpyromellitdiimide, thereby preparing said pyromellitic anhydride.

4,056,543
PROCESS OF PREPARING SUBSTITUTED ACRYLATES

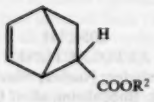
Ignazio Salvatore Ponticello, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 7, 1976, Ser. No. 721,149
Int. Cl.² C07D *303/16*; C07C *69/52*
U.S. Cl. 260—348.59 **7 Claims**

1. A process for preparing methylenemalonates having the formula



wherein R^2 is selected from the group consisting of alkyl or R^1; R^1 is selected from the group consisting of alkyl, allyl R^5—$O(CH_2)_n$, glycidyl, haloalkyl, vinyl, propargyl, and cycloalkyl; R^5 is alkyl and n is an integer of from 1 to 10, comprising (1) reacting a compound having the formula



wherein R^2 is as described above with an electrophilic material having the formula $XCOOR^1$ wherein R^1 is as described above and X is halogen in the presence of an alkyl-substituted lithium amide complex at a temperature range of −78° C to −40° C and (2) pyrolyzing the resulting norbornene at a temperature of 400° C to 800° C at 1mm to 760mm-Hg pressure in an inert atmosphere.

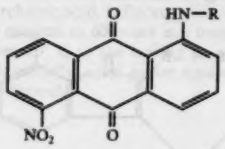
(I)

4,056,544
ANTHRAQUINONE COMPOUNDS

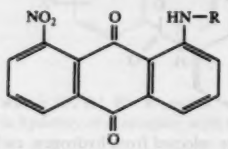
Walter Hohmann, Leverkusen; Helmut Herzog, Bergisch-Neukirchen, and Hans-Samuel Bien, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 15, 1974, Ser. No. 443,119
Claims priority, application Germany, Feb. 16, 1973, 2307591
Int. Cl.² C09B *1/16*
U.S. Cl. 260—378 **5 Claims**

1. Compound of the formula



or



in which

R is cycloalkyl or

and R_1 and R_2 are alkyl.

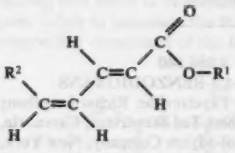
4,056,545
MANUFACTURE OF OLEFINICALLY UNSATURATED ESTERS

Werner Hoffmann, Neuhofen, and Manfred Baumann, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 14, 1976, Ser. No. 705,280
Claims priority, application Germany, Aug. 5, 1975, 2534859
Int. Cl.² C09F *5/08, 7/10*; C11C *3/00*
U.S. Cl. 260—410 **8 Claims**

1. A process for the manufacture of Δ,β, γ,δ-unsaturated esters containing a high proportion of the 2(E), 4(Z)-isomer of the formula:

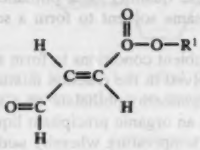
(I)



wherein R^1 is a saturated hydrocarbon radical of 1 to 4 carbon atoms and R^2 is a linear or branched hydrocarbon radical of 1 to 10 carbon atoms, which process comprises slowly introducing an ether solvent solution of a phosphorane of the formula:

$$R^2 - CH = P(R^3)_3 \quad \text{(II)}$$

wherein R^2 is as defined above and R^3 is phenyl or tolyl, at from 60° to 150° C, into an ether solvent solution of a fumaraldehyde-acid ester of the formula:


(III)

wherein R^1 is as defined above.

4,056,546

HYDROCARBONOXY-CONTAINING SILICONE FLUIDS USEFUL AS HYDRAULIC FLUIDS

Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 429,386, Dec. 28, 1973, Pat. No. 3,984,449, which is a division of Ser. No. 256,483, May 24, 1972, Pat. No. 3,821,114. This application July 30, 1976, Ser. No. 710,090

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

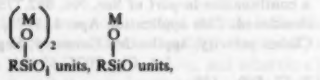
Int. Cl.² C10M *3/46, 3/44*

U.S. Cl. 260—448.8 R **5 Claims**

1. A silicone fluid useful as a hydraulic fluid consisting essentially of a polymer having 75 to 95 mole percent by weight of polymeric units selected from the class consisting of from

R_2SiO_1 units

and R_2SiO units and mixtures thereof, 5 to 25 mole percent of polymeric units selected from the class consisting of


$RSiO_1$ units, $RSiO$ units,

and $RSiO_{3/2}$ units and mixtures thereof with trace amounts of other units selected from the class consisting of $(MO)_3SiO_{1/2}$ units, $(MO)_2SiO$ units, $MOSiO_{3/2}$ units, SiO_2 units and $R_3SiO_{3/2}$ units and substantially free of disiloxanes, wherein the molar amount of MO groups present based on the total moles of R and MO groups present may vary from 5 to 95 mole percent, wherein the viscosity of the polymer may vary from 2 to 400 centistokes at 25° C, R is a lower alkyl radical, M is selected from the class consisting of ROR'—, ROR'OR'—, and $R(OC_xH_{2x})_n$— such that R is as previously defined, R' is selected from the class consisting of alkylene and arylene radicals of 1 to 10 carbon atoms, x varies from 2 to 4 and n varies from 4 to 100.

4,056,547

PROCESS FOR THE PREPARATION OF ORGANIC ISOCYANATE COMPOUNDS

Yoshiaki Tanaka, Osaka; Susumu Handa, Wakayama; Atsushi Nishibata, Wakayama; Sadashi Ueda, Wakayama; Yoshiaki Inamoto, Wakayama; Masahiro Saito, Wakayama; Fumio Tanimoto, Kyoto, and Hisao Kitano, Osaka, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sept. 24, 1976, Ser. No. 726,205

Claims priority, application Japan, Oct. 7, 1975, 50-121047

Int. Cl.² C07C *118/00*

U.S. Cl. 260—453 P **4 Claims**

1. A process for preparing organic isocyanates which comprises reacting at a temperature of from 150° to 250° C, for from 0.1 to 10 hours, an alkali metal or ammonium cyanate, or mixture thereof, with a compound having the formula

$$(X)_nRCH_2Cl$$

wherein X is chlorine, alkyl, cycloalkyl, alkenyl, phenyl, chloromethylphenyl or chloromethyl, n is zero or an integer of from 1 to 3 and R is an aromatic hydrocarbon radical, and X can be the same or different when n is more than 1,

in the presence of a catalyst composition consisting essentially of (a) from 0.1 to 20 weight percent, based on the weight of said compound, of a cuprous salt selected from the group consisting of cuprous chloride, cuprous bromide, cuprous thiocyanate, cuprous cyanate and mixtures thereof, and (b) a nitrogen compound selected from the group consisting of triethylene diamine, pyridine, ethylpyridine, lutidine, collidine, trimethylamine, triethylamine, tripropylamine, tributylamine, triamylamine, trihexylamine, tri-higher-alkylamines, dimethylbenzylamine, methyldibenzylamine, tribenzylamine, dimethylnaphthylamine, N-methylpiperidine, N-methylmorpholine, N-butylmorpholine, N,N'-dimethylpiperazine, tetramethylammonium chloride, tetraethylammonium chloride, trimethylbenzylammonium chloride, dimethylbenzyl-higher-alkylammonium chloride, tetramethylammonium bromide, tetraethylammonium bromide, trimethylbenzylammonium bromide, 1,8-diazabicyclo[5.4.0]-7-undecene and mixtures thereof, in an amount of said nitrogen compound equivalent to from 0.05 to 1.25 gram atoms of nitrogen per gram mole of said cuprous salt, and in a solvent, or mixture of solvents, having a dielectric constant (ϵ) of $\leqq$ 20, which are free of active hydrogen atoms and which have a boiling point of from 150° to 400° C.

4,056,548

CURABLE POLYENE-POLYTHIOL COMPOUNDS AND METHODS FOR PREPARATION AND CURING

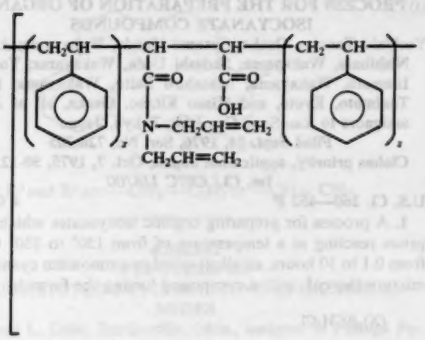
Donald W. Larsen, Marriottsville, Md., assignor to W. R. Grace & Co., New York, N.Y.

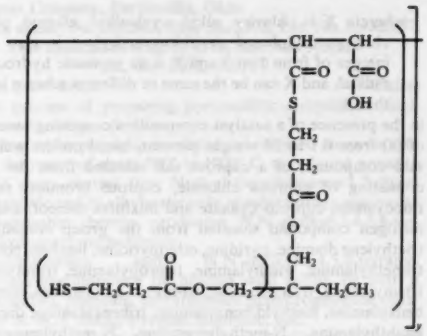
Division of Ser. No. 677,649, April 16, 1976, Pat. No. 3,996,257, which is a division of Ser. No. 504,410, Sept. 9, 1974, Pat. No. 3,966,794, which is a continuation of Ser. No. 259,148, June 2, 1972, abandoned. This application Sept. 17, 1976, Ser. No. 723,851

Int. Cl.² C07C *153/11*

U.S. Cl. 260—455 R **1 Claim**

1. A polymer comprising recurring structural units of the formula:





wherein z is from 1 to about 3 and y is from 1 to about 10.

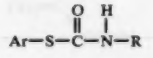
4,056,549

S-3-METHOXYPHENYL N-ALKYLTHIOLCARBAMATES AND S-3-METHYLTHIOPHENYL N-ALKYLTHIOLCARBAMATES

Jay Kent Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 7, 1976, Ser. No. 693,666
Int. Cl.[2] C07C *155/00*; A01N *9/12*
U.S. Cl. 260—455 A **4 Claims**

1. A S-substituted phenyl N-alkylthiolcarbamate represented by the general formula:



wherein:

Ar is selected from the group consisting of 3-methoxyphenyl and 3-methylthiophenyl; and

R is an alkyl of from one to four carbon atoms.

4,056,550

ALPHA-CYANOETHYLPHTHALATE AND PREPARATION THEREOF

Francois A. Lavallee, Willoughby Hills, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 468,405, May 9, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,454
Int. Cl.[2] C07C *121/66*
U.S. Cl. 260—465 D **15 Claims**

1. A solid stereo isomer mixture having meso and dl-isomers of crystalline alpha-cyanoethylphthalate with a refractive index of about 1.5349$n_D^{21°}$ and a melting point in the range from about 62° C to about 66° C wherein said mixture contains about 80% by weight of the predominant meso isomer and about 20% by weight of the dl-isomers.

6. A method for preparing a solid stereo isomer mixture having meso and dl-isomers of crystalline alpha-cyanoethylphthalate which comprises:

a. dissolving lactonitrile and an amine in a liquid organic solvent to form a first solution,

b. dissolving a stoichiometric quantity of a phthalic acid halide compound in the same solvent to form a second solution,

c. mixing the solutions at ambient conditions to form alpha-cyanoethylphthalate dissolved in the reaction mixture,

d. precipitating the alpha-cyanoethylphthalate as a stereo isomer mixture by adding an organic precipitant liquid to the reaction mixture at a temperature whereby said mixture contains about 80% by weight of the predominant meso isomer and about 20% by weight of the dl-isomers, and

separating the precipitated stereoisomer mixture from the reaction mixture.

4,056,551

PREPARATION OF SUCCINYLSUCCINIC ACID DIESTERS

Mitsuhiro Goi, and Masahiko Miyashita, both of Hirakata, Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 5, 1976, Ser. No. 739,284
Claims priority, application Japan, Nov. 17, 1975, 50-138432; Nov. 27, 1975, 50-143094
Int. Cl.[2] C07C *67/30, 69/95*
U.S. Cl. 560—126 **8 Claims**

1. In the process for preparing a succinylsuccinic acid diester by subjecting a γ-haloacetoacetic acid ester to dimerization in the presence of a base in a reaction medium, the improvement which comprises carrying out the dimerization in a mixed medium of an alcohol having at least 2 carbon atoms and water containing a water-immiscible organic compound selected from the group consisting of halogenated aliphatic hydrocarbons and aromatic hydrocarbons in an amount of 0.5 to 40% by volume based on the total volume of an alcohol and water.

4,056,552

ETHYL 3,7-CYCLODECADIENE-1-CARBOXYLATE

Günther Wilke, and Paul Heimbach, both of Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Division of Ser. No. 463,089, April 22, 1974, Pat. No. 3,920,762, which is a division of Ser. No. 109,949, Jan. 26, 1971, Pat. No. 3,849,506, which is a division of Ser. No. 845,904, July 29, 1969, abandoned, Ser. No. 845,901, July 29, 1969, Pat. No. 3,629,347, and Ser. No. 843,220, July 18, 1969, Pat. No. 3,586,727, each is a continuation-in-part of Ser. No. 582,775, Sept. 27, 1966, abandoned. This application Apr. 4, 1975, Ser. No. 565,282
Claims priority, application Germany, Sept. 29, 1965, 24439
Int. Cl.[2] C07C *69/74*
U.S. Cl. 560—128 **1 Claim**

1. Ethyl-3,7-cyclodecadiene-1-carboxylate.

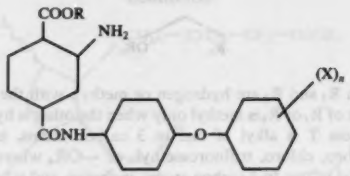
4,056,553

3-AMINO-4-CARBOALKOXY-BENZOIC ACID 4'-PHENOXY-ANILIDES

Friedrich Wilhelm Weingarten, Liederbach, Taunus, and Klaus Hunger, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 13, 1976, Ser. No. 686,008
Claims priority, application Germany, May 15, 1975, 2521649
Int. Cl.[2] C07C *103/78*
U.S. Cl. 560—43 **8 Claims**

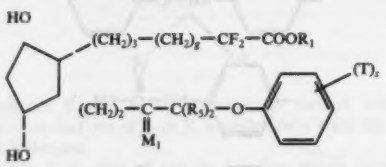
1. A compound of the formula



wherein R is methyl or ethyl, X stands for equal or different halogen atoms and *n* is an integer of 1 to 4 or zero.

4,056,554
2,2-DIFLUORO-16-PHENOXY-13,14-DIHYDRO-PGF$_1$ ANALOGS
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 552,708, Feb. 25, 1975, Pat. No. 4,001,300. This application Sept. 17, 1976, Ser. No. 724,238
Int. Cl.^{2} C07C *65/22*
U.S. Cl. 560—60 **58 Claims**

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof,

wherein *g* is 2 to 4, inclusive;

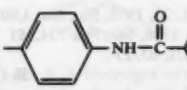
wherein M_1 is

or

wherein R_7 and R_8 are hydrogen or methyl, with the proviso that one of R_7 or R_8 is methyl only when the other is hydrogen;

wherein T is alkyl of one to 3 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_4 wherein R_4 is alkyl of one to 3 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with 1, 2, or 3 chloro, alkyl of 1 to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation,



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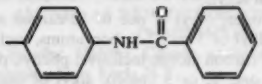
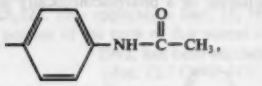
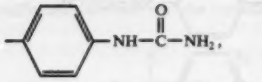
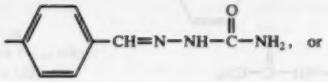
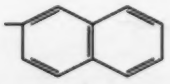








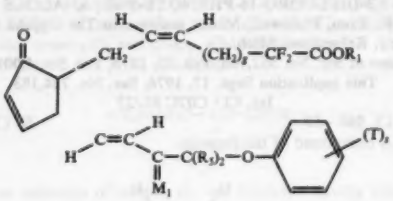


; and

wherein R_5 is hydrogen or methyl, with the proviso that R_5 is methyl only when R_7 and R_8 are both hydrogen.

4,056,555
2,2-DIFLUORO-16-PHENOXY-PGA$_2$ ANALOGS
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 552,708, Feb. 24, 1975, Pat. No. 4,001,300. This application Sept. 17, 1976, Ser. No. 724,152
Int. Cl.^{2} C07C *65/22*
U.S. Cl. 560—53 **58 Claims**

1. A compound of the formula

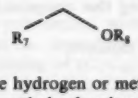


or a mixture comprising that compound and the enantiomer thereof,

wherein *g* is 2 to 4, inclusive;

wherein M_1 is

or

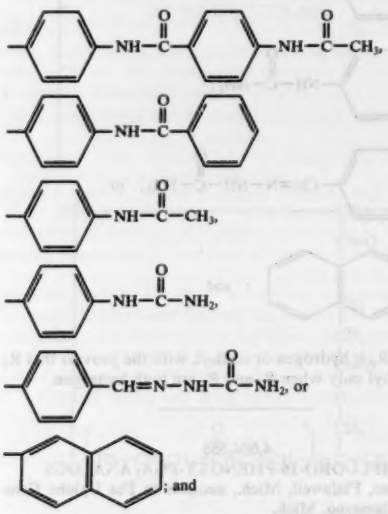


wherein R_7 and R_8 are hydrogen or methyl, with the proviso that one of R_7 or R_8 is methyl only when the other is hydrogen;

wherein T is alkyl of one to 3 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_4 wherein R_4 is alkyl of one to 3 carbon atoms, inclusive, and wherein *s* is

zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation,



wherein R_5 is hydrogen or methyl, with the proviso that R_5 is methyl only when R_7 and R_8 are both hydrogen.

4,056,556

2,2-DIFLUORO-16-PHENOXY-PGE$_2$ ANALOGS

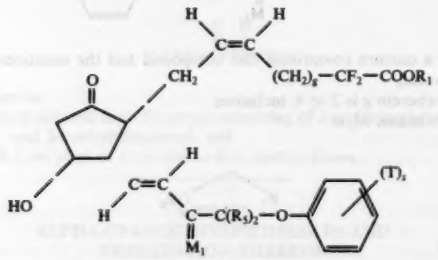
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 552,708, Feb. 25, 1975, Pat. No. 4,001,300. This application Sept. 17, 1976, Ser. No. 724,153

Int. Cl.^{2} C07C *65/22*

U.S. Cl. 560—53 **58 Claims**

1. A compound of the formula

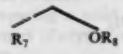


or a mixture comprising that compound and the enantiomer thereof,

wherein g is 2 to 4, inclusive;

wherein M_1 is

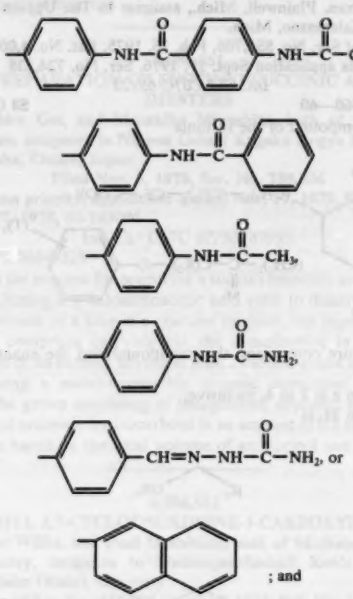
-continued



wherein R_7 and R_8 are hydrogen or methyl, with the proviso that one of R_7 or R_8 is methyl only when the other is hydrogen;

wherein T is alkyl of one to 3 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_4 wherein R_4 is alkyl of one to 3 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation,



wherein R_5 is hydrogen or methyl, with the proviso that R_5 is methyl only when R_7 and R_8 are both hydrogen.

4,056,557

2,2-DIFLUORO-16-PHENOXY-PGF$_1$ ANALOGS

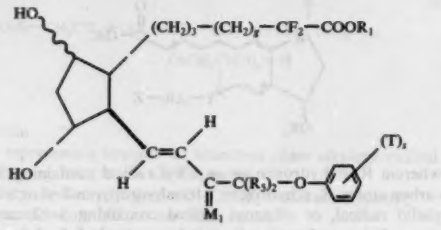
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 552,708, Feb. 25, 1975, Pat. No. 4,001,300. This application Sept. 17, 1976, Ser. No. 724,151

Int. Cl.^{2} C07L *65/21*

U.S. Cl. 560—60 **58 Claims**

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof,

wherein g is 2 to 4, inclusive;

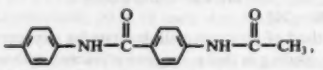
wherein M_1 is

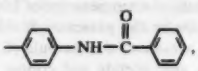
or

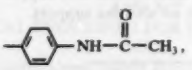
wherein R_7 and R_8 are hydrogen or methyl, with the proviso that one of R_7 or R_8 is methyl only when the other is hydrogen;

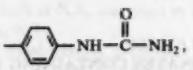
wherein T is alkyl of one to 3 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_4$ wherein R_4 is alkyl of one to 3 carbon atoms, inclusive, and wherein s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl;

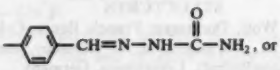
wherein R_1 is hydrogen, alkyl of one to 22 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation,











; and

wherein R_5 is hydrogen or methyl, with the proviso that R_5 is methyl only when R_7 and R_8 are both hydrogen.

4,056,558

SULFOSUCCINATES OF POLYHYDROXY TERTIARY AMINES AS NEW DETERGENT-SOFTENER COMPOUNDS

Bjorn Sundby, Halifax, Canada, assignor to Colgate-Palmolive Company, New York, N.Y.

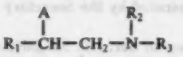
Continuation-in-part of Ser. No. 205,395, Dec. 6, 1971, Pat. No. 3,928,422. This application Dec. 12, 1973, Ser. No. 424,250

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.[2] C07C *143/15*

U.S. Cl. 560—151 **12 Claims**

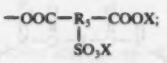
1. Sulfosuccinate esters of the formula:



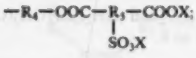
wherein

R_1 is C_{8-24} alkyl;

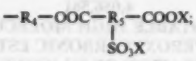
A is OH or



R_2 is C_{1-6} alkyl or hydroxyalkyl or



R_3 is C_{1-6} hydroxyalkyl or

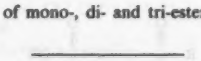


R_4 is C_{1-6} alkylene;

R_5 is ethylene or C_{1-6} alkyl-substituted ethylene;

X is H or a salt-forming member of the group consisting of alkali metal, ammonium, mono, di-and tri-C_{1-4} alkylamine, and mono-, di- and tri-C_{1-4} alkanolamine;

and at least one of R_2 and R_3 is



or mixtures of mono-, di- and tri-esters having said formula.

4,056,559

NOVEL POLYMERS OF ALKYL METHACRYLATES

Sheldon N. Lewis, Willow Grove, and Richard A. Haggard, Fort Washington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 371,921, June 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 137,057, April 23, 1971, abandoned. This application Oct. 23, 1974, Ser. No. 517,336

Int. Cl.[2] C07C *9/54*

U.S. Cl. 526—212 **18 Claims**

1. An anionically-polymerized addition homopolymer or copolymer of at least one ester of methacrylic acid selected from the group consisting of (C_1-C_{24}) alkyl esters of methacrylic acid, di(C_1-C_4) alkylamino (C_2-C_4) alkyl esters of methacrylic acid, (C_2-C_{12}) alkoxyalkyl esters of methacrylic acid, (C_7-C_{12}) aryloxyalkyl esters of methacrylic acid, (C_7-C_{12}) aralkoxyalkyl esters of methacrylic acid, and (C_7-C_{10}) aralkyl esters of methacrylic acid, and, in a copolymer, other anioni-

cally copolymerizable monomers, wherein *n*, the average chain length of the homopolymer or copolymer, is about 6to 50 mers; the polymerization being carried out, in the presence of an alcohol and a catalytic amount of an alkoxide, using controlled rates of addition of at least one of the ester, the alcohol and the alkoxide.

4,056,560

N,N'-BIS(3,4-DICYANOPHENYL) ALKANEDIAMIDES

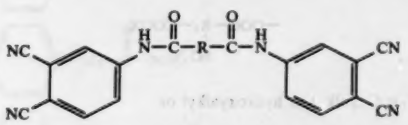
James R. Griffith, Riverdale Heights, and Jacques G. O'Rear, Temple Hills, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 500,209, Aug. 23, 1974, Pat. No. 3,993,631. This application July 23, 1976, Ser. No. 707,979

Int. Cl.[2] C07C *121/78*

U.S. Cl. 260—465 D **6 Claims**

1. A composition of matter having the formula:



wherein R = $(CH_2)_{n-2}$ and $(CH_2)_xCHCH_3(CH_2)_y$, n = 3 to 20; x = 1 to 8; y = 1 to 8.

4,056,561

THERMALLY STABLE HIGH MOLECULAR WEIGHT ACYL PEROXYCARBONIC ESTERS IN VULCANIZATION OF SILICONE RUBBER

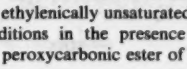
Roger N. Lewis, Martinez; Ronald L. Pastorino, Larkspur, and James F. Wilts, Richmond, all of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 696,463, June 16, 1976. This application Mar. 7, 1977, Ser. No. 774,832

Int. Cl.[2] C08G *77/04*; C08F *2/00*

U.S. Cl. 260—46.5 G **8 Claims**

1. A process for the vulcanization of silicone rubber comprising: subjecting ethylenically unsaturated silicone rubber to vulcanization conditions in the presence of a vulcanizing amount of an acyl peroxycarbonic ester of the formula:



where R is selected from methyl and ethyl; and R' is an alkyl group which together with R contains a total of 17 to about 25 carbon atoms.

4,056,562

3,5-BISOXYGENATED 2-(ω-HALO-3-OXYGENATED-1-ALKENYL)-CYCLOPENTANE-1-HEPTANOIC ACIDS AND DERIVATIVES THEREOF

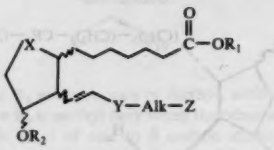
Richard A. Mueller, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 577,675, May 15, 1975, Pat. No. 3,997,588. This application July 19, 1976, Ser. No. 706,364

Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—231 **12 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or an alkyl radical containing 1–12 carbon atoms; R_2 is hydrogen, a tetrahydropyran-2-yl or trialkylsilyl radical, or alkanoyl radical containing 1–12 carbon atoms; X is a carbonyl radical; Y is a radical of the formula

A being hydrogen or an alkanoyl radical containing 1–12 carbon atoms and B being hydrogen or an alkyl radical containing 1–12 carbon atoms; Z is a chloro, bromo, or iodo radical; Alk is an alkylene radical containing 3–8 carbon atoms; and the wavy lines represent the alternative α and β stereochemical configuration.

4,056,563

METHOD OF PRODUCING ALLYLACETATE

Varazdat Karapetovich Boyadzhian, ulitsa Grachia Nersesiana, 10, kv. 1; Saribek Saakovich Khachatrian, ulitsa Agaiana, 10, kv. 1-a; Genrikh Gevorkovich Stepanian, ulitsa Olega Koshevogo, 5, kv. 75; Volodya Karapetovich Eritsian, Achapniak, 11, kvartal 6, kv. 35; Edik Stepanovich Agavelian, ulitsa Grachia Kochara, 12, kv. 6, all of Erevan; Oleg Matveevich Nefedov, ulitsa Shukhova, 5/7, kv. 15, Moscow; Igor Evgenievich Dolgy, ulitsa Vernadskogo, 95, korpus 2, kv. 262, Moscow; Mikhail Fedorovich Sisin, ulitsa Schepkina, 30, kv. 12, Moscow; Alexei Yakovlevich Kolbasin, Salavat, bulvar Matrosova, 8/12, kv. 17, and Ivan Konstantinovich Anikeev, Salavat, ulitsa Kalinina, 38, kv. 70, both of Bashkirskaya ASSR, all of U.S.S.R.

Filed Jan. 28, 1976, Ser. No. 653,375

Claims priority, application U.S.S.R., Jan. 31, 1975, 2101054

Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—245 **2 Claims**

1. A method of producing allylacetate by oxyacetylation of propylene residing in that propylene is reacted with acetic acid and oxygen in a gaseous phase at a temperature of 150°–250° C under a pressure of 1–10 atg in the presence of the catalyst tetraammonium palladium acetate of the formula $(CH_3COO)_2$ containing sodium acetate, zinc acetate and copper acetylacetonate or copper acetateon an alumina support.

4,056,564

DIHYDROXY SULPHONATES CONTAINING ETHER STRUCTURES

Gerhard Dieter Wolf, Dormagen; Francis Bentz, Cologne, and Günther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

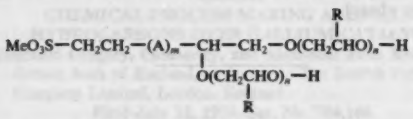
Filed July 22, 1975, Ser. No. 598,104

Claims priority, application Germany, Aug. 2, 1974, 2437218

Int. Cl.[2] C07C *143/42, 143/11*; C08G *63/12*; C08C *69/44*

U.S. Cl. 260—512 C **2 Claims**

1. Dihydroxy sulphonates containing ether groups and corresponding to the following general formula:



wherein

A represents a straight- or branched-chain alkylene radical having from 1 to 6 carbon atoms;

R represents hydrogen, a C_1–C_4 alkyl radical or phenyl;

Me represents NH_4 or an alkali metal;

m is 0 or 1; and

n is a number of from 1 to 30.

4,056,565

PROCESS FOR THE PRODUCTION OF ACRYLAMIDE AND METHACRYLAMIDE

Fujio Matsuda, Fujisawa, Japan, assignor to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed July 21, 1970, Ser. No. 56,967

Claims priority, application Japan, July 24, 1969, 44-58021; Oct. 9, 1969, 44-80309; Nov. 4, 1969, 44-87593; Nov. 25, 1969, 44-93945

Int. Cl.² C07C *103/133*

U.S. Cl. 260—561 N **5 Claims**

1. A process for the production of an amide, which comprises reacting a nitrile selected from the group consisting of acrylonitrile and methacrylonitrile with water in the presence of a catalyst consisting essentially of Raney copper.

4,056,566

ACIDIC EDIBLE PECTIN HYDROGEL CONTAINING COLLOIDALLY DISPERSED PROTEIN AND METAPHOSPHATE IONS FOR PREVENTING COAGULATION OF THE PROTEIN

Sakuichi Sakakibara, Kobe; Ko Sugisawa, and Yukio Kitamura, both of Nara, all of Japan, assignors to House Food Industrial Company Limited, Osaka, Japan

Filed Apr. 26, 1977, Ser. No. 791,015

Int. Cl.² A23L *1/04*

U.S. Cl. 426—577 **10 Claims**

1. An edible gel consisting essentially, in parts by weight, of 0.4 to 2.0 parts pectin, an amount of calcium or magnesium sufficient to cause gelling of said pectin, 0.1 to 30 parts of an edible acid, 0.1 to 1.5 parts metaphosphate ions, calculated as sodium metaphosphate, 20 to 98 parts water, and 2 to 70 parts of an edible protein, not more than 40% of the carboxyl groups in said pectin being esterified with methyl, the amount of said acid being sufficient to impart a pH of not more than 6.15 to said gel, and said protein being colloidally dispersed in said gel.

4,056,567

CHEMICAL PROCESSES FOR PREPARING CITRIC ACID

Vincent Lamberti, Upper Saddle River, and Eddie N. Gutierrez, Fort Lee, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,449

Int. Cl.² C07C *59/16*

U.S. Cl. 260—535 P **17 Claims**

1. A process for preparing calcium, magnesium and strontium salts of citric acid and mixtures thereof comprising the corresponding salt or mixture of salts of a tricarboxylic acid selected from the group consisting of cis-aconitic acid, trans-aconitic acid, isocitric acid, alloiso-citric acid and mixtures thereof, in an aqueous medium at a temperature of at least about 160° C and in the presence of an alkali metal hydroxide or an alkaline earth metal hydroxide selected from the group consisting of calcium hydroxide, magnesium hydroxide, strontium hydroxide and mixtures thereof.

4,056,568

2,6-DIALKYL-4-HYDROXYSULFENYL CHLORIDES

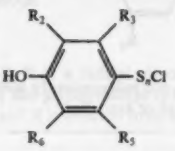
Merle Edward Cisney, Camas, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 561,391, March 24, 1975, abandoned. This application Mar. 1, 1976, Ser. No. 662,292

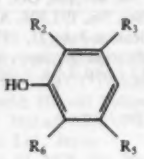
Int. Cl.² C07C *145/00*

U.S. Cl. 260—543 H **13 Claims**

1. A method of preparing a sulfenyl chloride having the formula



wherein R_3 and R_5 are lower alkyl groups, R_2 and R_6 are hydrogen or lower alkyl groups, and *n* is 1 or 2, which method comprises reacting S_nCl_2 with only an equimolar amount of a 3,5-dialkyl phenol having the formula



in an inert solvent.

4,056,569

ORTHO-[(ALKYLTHIO)(AMINOCARBONYL)METHYL]-ANILINES

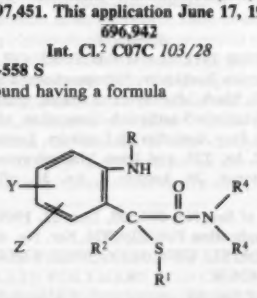
Paul G. Gassman, Columbus, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Division of Ser. No. 563,783, March 31, 1975, Pat. No. 3,996,264, which is a division of Ser. No. 355,207, April 27, 1973, Pat. No. 3,897,451. This application June 17, 1976, Ser. No. 696,942

Int. Cl.² C07C *103/28*

U.S. Cl. 260—558 S **3 Claims**

1. A compound having a formula



wherein R is hydrogen, a hydrocarbon radical free from aliphatic unsaturation and containing from 1 to 8 carbon atoms, or a lower alkanoyl;

R^1 is lower alkyl, phenyl or benzyl;

R^2 is hydrogen, lower alkyl, phenyl or benzyl;

each R^4 is hydrogen or a lower alkyl;

each of Y and Z is hydrogen or a substituent selected from the group consisting of halogen, nitro, cyano, lower alkyl and lower alkyloxy.

4,056,570

ACYLFORMANIDINE INSECTICIDAL AND MITICIDAL COMPOUNDS

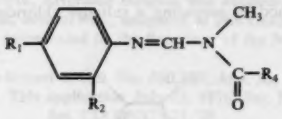
Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 575,313, May 7, 1975, Pat. No. 3,962,305, which is a division of Ser. No. 439,507, Feb. 4, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,520

Int. Cl.[2] C07C *123/127*

U.S. Cl. 260—562 B 6 Claims

1. The compound having the formula



wherein R_1 and R_2 are independently methyl or halogen and R_4 is either haloalkyl or ketoalkyl.

4,056,571

PROCESS FOR THE PREPARATION OF TERTIARY PHOSPHINE OXIDES

Hans-Jerg Kleiner, Bad Soden, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

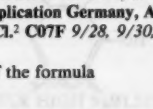
Continuation of Ser. No. 407,580, Oct. 18, 1973, abandoned, which is a division of Ser. No. 171,305, Aug. 12, 1971, Pat. No. 3,790,638. This application June 21, 1976, Ser. No. 698,002

Claims priority, application Germany, Aug. 13, 1970, 2040208

Int. Cl.[2] C07F *9/28, 9/30, 9/50*

U.S. Cl. 260—583 E 6 Claims

1. A compound of the formula



in which R_1 and R_2 are alkyl of 1 to 12 carbon atoms, n is 3, and R is

$$-NR_4R_5$$

in which R_4 is hydrogen, and R_5 is hydrogen.

4,056,572

METHOD FOR THE MANUFACTURE OF PHENOLS

Andrei Nikolaevich Bashkirov, Novopeschanaya ulitsa, 21, korpus 1, kv. 13; Mark Markovich Grozhan, prospekt Kalinina, 31, kv. 49; Vladimir Vasilievich Kamzolkin, ulitsa Vavilova, 55/5, kv. 25; Jury Anatolievich Lapitsky, Leninsky prospekt, 83, korpus 2, kv. 226, and Irina Vladimirovna Vygodskaya, ulitsa Novatorov, 36, korpus 9, kv. 38, all of Moscow, U.S.S.R.

Continuation of Ser. No. 887,339, Dec. 22, 1969, abandoned. This application Feb. 22, 1974, Ser. No. 444,984

Int. Cl.[2] C07C *39/06, 39/08, 67/05*

U.S. Cl. 260—624 R 14 Claims

1. A method for the production of a monohydric phenol comprising subjecting an alkyl benzene wherein the alkyl moiety consists of at least one alkyl group selected from the group consisting of methyl and ethyl groups to liquid-phase oxidation with oxygen at a temperature of 180°–250° and under a pressure of 15–30 atm in the presence of

a. 0.0006 to 10 mole percent of a strongly acidic catalyst and

b. an esterifying agent selected from the group consisting of lower alkanoic carboxylic acid anhydrides and acid chlorides, followed by saponification or hydrolysis of the resulting monohydric phenolic ester to form the monhydric phenol.

4,056,573

SYNTHESIS OF ACYCLIC, TERPENE ALCOHOLS

Ralph E. Close, and John M. Derfer, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

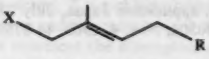
Continuation-in-part of Ser. No. 571,375, April 24, 1975, abandoned. This application July 1, 1976, Ser. No. 701,699

Int. Cl.[2] C07C *29/00, 41/00*

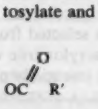
U.S. Cl. 260—631.5 8 Claims

1. A process for the preparation of 3,7-dimethyloctan-1-ol and derivatives thereof substituted at the 7-position with an hydroxy or ether group, comprising the steps of

a. coupling 3-methylbut-1-yn or the 3-hydroxy or ether substituted derivative thereof with a C_5 coupling reagent having the configuration



X being a leaving group selected from the group consisting of chloride, bromide, iodide, tosylate and mesylate, R being



or OR', R' being a lower alkyl up to 5 carbon atoms, phenyl, substituted phenyl up to 10 carbon atoms, aralkyl up to 10 carbon atoms or cycloalkyl up to 10 carbon atoms;

b. said coupling being carried out in the presence of a cuprous salt and an acid scavenger;

c. subjecting the reaction product of step a,b) to hydrogenation and saponification or ether cleavage to convert the ester or ether group in the 1-position to an hydroxyl group.

4,056,574

OXIDATIVE COUPLING PROCESS

David Holland; David John Milner, both of Runcorn, and Hugh Wilma Boulton Reed, Middlesborough, all of England, assignors to Imperial Chemical Industries Limited, London, England

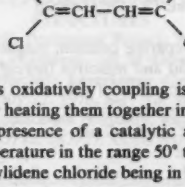
Filed Apr. 26, 1976, Ser. No. 680,124

Claims priority, application United Kingdom, Apr. 28, 1975, 17511/75

Int. Cl.[2] C07C *21/00*

U.S. Cl. 260—654 R 6 Claims

1. A process for the preparation of 1,1-dichloro-4-methyl penta-1,3-diene of formula



which comprises oxidatively coupling isobutene with vinylidene chloride by heating them together in homogeneous liquid medium in the presence of a catalytic amount of palladium acetate at a temperature in the range 50° to 150° C, the ratio of isobutene to vinylidene chloride being in the range 2 to 1 to 15 to 1.

4,056,575

CHEMICAL PROCESS MAKING AROMATIC HYDROCARBONS OVER GALLIUM CATALYST

Reginald Gregory, Camberley, and Alexander John Kolombos, Sutton, both of England, assignors to The British Petroleum Company Limited, London, England

Filed July 12, 1976, Ser. No. 704,166

Claims priority, application United Kingdom, July 17, 1975, 30012/75; Nov. 20, 1975, 47829/75; June 11, 1976, 24297/75

Int. Cl.[2] C07C *3/04*

U.S. Cl. 260—673.5 23 Claims

1. A process for the production of aromatic hydrocarbons comprising subjecting an unsaturated hydrocarbon containing at least six carbon atoms to aromatisation in the presence of a catalyst consisting essentially of elemental gallium or a compound of gallium deposited on a support.

4,056,576

CHEMICAL PROCESS OVER GALLIUM CATALYST CONVERTING SATURATED HYDROCARBONS TO OLEFINS

Reginald Gregory, Camberley, and Alexander John Kolombos, Sutton, both of England, assignors to The British Petroleum Company Limited, London, England

Filed July 12, 1976, Ser. No. 704,167

Claims priority, application United Kingdom, July 17, 1975, 30012/75; Nov. 20, 1975, 47829/75; June 11, 1976, 24296/76

Int. Cl.[2] C07C *3/28*

U.S. Cl. 260—683.3 12 Claims

1. A process for producing olefinic hydrocarbons from the corresponding C_3–C_8 saturated hydrocarbon feedstock comprising subjecting the feedstock to dehydrogenation conditions in the presence of a catalyst composition consisting essentially of elemental gallium or a compound of gallium deposited on a support.

4,056,577

SEPARATION OF ACID-HYDROCARBON EMULSIONS AND ALKYLATION PROCESS UTILIZING SAID SEPARATION

Thomas Hutson, Jr., and Donald J. Makovec, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 11, 1976, Ser. No. 741,315

Int. Cl.[2] C07C *3/54;* B01D *17/04*

U.S. Cl. 260—683.48 9 Claims

1. A process for achieving rapid separation of HF acid-hydrocarbon emulsions into separate HF acid and hydrocarbon phases which comprises adding to said emulsion a finite amount of up to about 700 ppm of a tetraalkylammonium iodide coalescing promoter, based on HF acid present in said emulsion, and allowing said emulsion containing said coalescing promoter to separate into an HF acid phase and a hydrocarbon phase.

4,056,578

ISOPARAFFIN-OLEFIN ALKYLATION PROCESS USING A SUPPORTED PERFLUORINATED POLYMER CATALYST

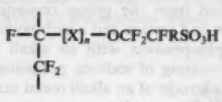
James D. McClure, and Stanley G. Brandenberger, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 663,956, March 4, 1976, Pat. No. 4,038,213. This application Apr. 1, 1977, Ser. No. 783,522

Int. Cl.[2] C07C *3/54*

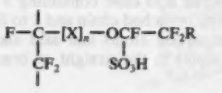
U.S. Cl. 260—683.47 8 Claims

1. A liquid phase alkylation process which comprises contacting a C_4 to C_6 isoparaffin or mixtures thereof with an olefin selected from the group consisting of C_2 to C_5 monoolefins or mixtures thereof at a reaction temperature of between about 80° C and about 225° C and with a catalyst composition comprising a solid perfluorinated polymer catalyst supported on an inert porous carrier having an average pore diameter of between about 50 A and about 600 A in a weight ratio of catalyst to support of between about 0.5:100 and about 20:100 wherein said catalyst contains a repeating structure selected from the group of:



a)

or



b)

where n is 0, 1 or 2; **R is a radical selected from the group consisting of fluorine and perfluoroalkyl radicals having from** 1 to 10 carbon atoms; and X is selected from the group consisting of:

$[O(CF_2)_m]$, $[OCF_2CFY]$ or $[OCFYCF_2]$

where m is an integer from 2 to 10 and Y is a radical selected from the class consisting of fluorine and the trifluoromethyl radical.

4,056,579

NOVEL THERMOSETTING RESIN COMPOSITION AND CURED PRODUCT THEREFROM

Akio Nishikawa, Hitachi; Hitoshi Yokono, Katsuta; Shun-ichi Numata, and Junji Mukai, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 15, 1975, Ser. No. 613,543

Claims priority, application Japan, Sept. 30, 1974, 49-111543

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—830 P 8 Claims

1. A thermosetting resin composition consisting essentially of (a) an isocyanate group-terminated condensate obtained by reacting a polycarboxylic acid compound having at least one acid anhydride ring with a stoichiometric excess of a polyfunctional isocyanate compound or said condensate containing the unreacted isocyanate compound, (b) a polyfunctional epoxy compound, the isocyanate group-terminated condensate or said condensate containing the unreacted isocyanate compound being present in an equivalent ratio of isocyanate compound to the polyfunctional epoxy compound of 0.2 : 1 to 4 : 1, and (c) a catalyst which forms mainly isocyanurate rings and oxazolidone rings selected from the group consisting of tertiary amine tetraphenylborates, N-substituted morpholine tetraphenylborates, imidazole tetraphenylborates and onium salt tetraphenylborates, the amount of said catalyst being from about 0.01 to 10% by weight based on the weight of the condensate and the polyfunctional epoxy compound.

4,056,580

METHOD FOR PREPARATION OF METHACRYLATE AND ACRYLATE POLYMERS AND COPOLYMERS BY ANIONIC POLYMERIZATION

Lubomir Lochmann, and Jiri Trekoval, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Nov. 21, 1974, Ser. No. 525,854

Claims priority, application Czechoslovakia, Nov. 26, 1973, 8136/73; May 24, 1974, 3734/74; July 3, 1974, 4690/74

Int. Cl.[2] C08F *2/00, 4/46, 20/10, 293/00*

U.S. Cl. 260—881 12 Claims

1. A method for the preparation of acrylate and methacrylate polymers and copolymers by anionic polymerization com-

prising the step of polymerizing at least an acrylate or methacrylate monomer in the presence of an initiating system selected from the group consisting of an alpha-lithium carboxylic acid ester and an alkoxide of a heavier alkali metal selected from the group consisting of sodium, potassium, rubidium and cesium, a carboxylic acid ester substituted in the alpha-position with an alkali metal selected from the group consisting of sodium, potassium, rubidium and cesium and a carboxylic acid ester substituted in the alpha-position with an alkali metal selected from the group consisting of sodium, potassium, rubidium, and cesium and an alkoxide of an alkali metal selected from the group consisting of lithium, sodium, potassium, rubidium and cesium, said carboxylic acid ester containing 3 to 30 carbon atoms in the straight or branched chain and 1 to 6 ester groups bonded to different carbon atoms and said alkoxide containing 3 to 16 carbon atoms in the straight or branched chain.

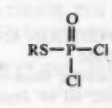
4,056,581

PROCESS FOR THE PREPARATION OF PHOSPHORODICHLORIDOTHIOLATES

Horst O. Bayer, Levittown, and William S. Hurt, Collegeville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 22, 1975, Ser. No. 607,078
Int. Cl.² C07F 9/20
U.S. Cl. 260—972 **28 Claims**

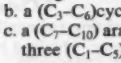
1. A process for preparing a phosphorodichloridothiolate of the formula



wherein R is

a. a (C_1–C_{10}) alkyl group, optionally substituted with a (C_1–C_4) alkoxy group, a (C_1–C_4) alkylthio group or a halogen atom;
b. a (C_3–C_6)cycloalkyl group;
c. a (C_7–C_{10}) aralkyl group, optionally substituted with up to three (C_1–C_5) alkyl groups, (C_1–C_5) alkoxy groups, halogen atoms, or nitro groups; or
d. a (C_6–C_{10}) aryl group, optionally substituted with up to three (C_1–C_5) alkyl groups, (C_1–C_5) alkoxy groups, halogen atoms or nitro groups;

which comprises reacting at a temperature of about −20° C. to about 50° C., a sulfenyl chloride of the formula



wherein R is as defined above,
with phosphorus trichloride, and water or a carboxylic acid.

4,056,582

HUMIDIFIER ASSEMBLY

Ho Chow, River Edge, N.J., assignor to Beatrice Foods Co., Chicago, Ill.

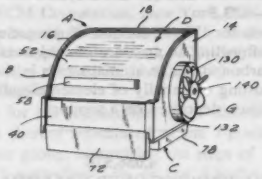
Continuation of Ser. No. 537,250, Dec. 30, 1974, abandoned.
This application June 7, 1976, Ser. No. 693,377
Int. Cl.² B01F 3/04
U.S. Cl. 261—30 **29 Claims**

1. A humidifier assembly comprising:

A. a housing defining at least a pair of operative apertures and comprising a rear wall adapted to be secured to an associated hot gas heating system, a stationary front section, a movable top cover section, and end walls, said front section having an opening therein remote from said top section, said rear wall and said heating system each having a port therein, said ports being in gaseous communication with each other, said rear wall port comprising one of said operative apertures;

B. an open-topped reservoir means slidably received in said housing through said opening and accessible at the front of said housing for removal and replacement;

C. a rotatable fluid carrier subassembly rotatably received in given position in said housing between said end walls with a portion thereof adapted to contact fluid within said reservoir means via the open top thereof, said reservoir means and said fluid carrier subassembly each being removable from said housing separately from each other;



D. means for rotating said fluid carrier subassembly through at least 360°; and

E. means for operatively connecting said rotating means with said fluid carrier subassembly;

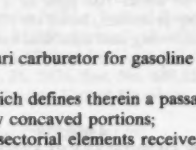
whereby gas to be humidified enters said housing through one of said apertures, passes through said fluid carrier subassembly to absorb moisture therefrom, and exits said housing through another of said apertures.

4,056,583

VARIABLE VENTURI CARBURETOR

Kazuo Shinoda, and Akira Ii, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed July 17, 1975, Ser. No. 596,726
Claims priority, application Japan, Feb. 7, 1975, 50-15923
Int. Cl.² F02M 9/06
U.S. Cl. 261—36 A **4 Claims**



1. A variable Venturi carburetor for gasoline engines which comprises:

a body member which defines therein a passage including a pair of sectorially concaved portions;

a pair of opposing sectorial elements received by said concaved portions and defining a Venturi passage therebetween;

a fuel nozzle means disposed to traverse a throat portion of said Venturi passage;

means for moving said pair of sectorial elements to vary the flow area of said throat portion;

a fuel supply passage connected with said fuel nozzle means for supplying fuel thereto;

said fuel supply passage including a variable orifice means which is controlled in relation to the movement of said sectorial elements so that the flow area of said orifice means is proportional to that of said throat portion;

a fuel pressure control valve which includes a biasing element actuated by the intake manifold vacuum of the engine;

said valve delivering fuel at a constant pressure when said

vacuum is greater than a predetermined value which generates an acoustic air flow through said throat opening, and at a pressure proportional to said vacuum when it is smaller than said predetermined value;

said fuel pressure regulating valve including a first diaphragm valve which comprises a relief valve structure operated by a diaphragm;

said diaphragm being controlled by a spring force and a second diaphragm which is actuated by the intake manifold vacuum;

said first diaphragm supports a valve member which cooperates with an end portion of a tube which is branched from the fuel supply passage;

said valve structure controlling the flow of fuel to be branched from said fuel supply passage and returned to a fuel tank;

said first diaphragm being urged towards said inner end of said tube by a compression coil spring which is supported at an opposite end by said second diaphragm; and

said second diaphragm being driven by the intake manifold vacuum so that it supports said opposite end of said compression coil spring at a predetermined limit position when the intake manifold vacuum is equal or greater than said predetermined value and is shifted rearward to loosen said compression coil spring when the intake mainfold vacuum is smaller than said predetermined value.

4,056,584

METHOD OF MAKING A GRAPHITE FUEL ELEMENT HAVING CARBONACEOUS FUEL BODIES

Gary N. Miertschin, and David F. Leary, both of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Sept. 30, 1974, Ser. No. 510,282
Int. Cl.[2] G21C *21/02*
U.S. Cl. 264—.5 **10 Claims**

1. A method of making a nuclear fuel element comprising the steps of providing a porous rigid fuel element block of graphite having a cavity of precise dimension formed therein, combining particulate nuclear fuel material having fission-product retentive coatings, particulate carbon, pitch, and a carbonizable coke-reducing additive which is effective to reduce the coke yield upon carbonization, said additive being selected from the group consisting of (1) polystyrene and styrene-butadiene copolymers having a molecular weight between about 500 and 1,000,000, (2) aromatic hydrocarbons having a molecular weight between about 75 and 300, and (3) saturated hydrocarbon polymers having a molecular weight between about 5,000 and 1,000,000, said pitch and said additive being heated to a temperature of at least 100° C., molding a green fuel body from said combination of materials under pressure, inserting said molded green fuel body into said cavity within said fuel element block and heating said molded green body in situ in said fuel element cavity to decompose the pitch and said additive leaving a relatively close-fitting fuel body in said cavity, which fuel body comprises coated nuclear fuel particles plus particulate carbon in a coke matrix formed from said carbonized pitch and additive, wherein said coke constitutes an amount not more than 25 weight percent of the original weight of pitch plus said additive.

4,056,585

TOOTH DIE AND METHOD AND APPARATUS FOR MAKING THE SAME

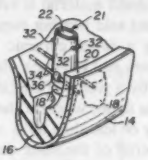
Robert W. Waltke, 39-32 215th Place, Bayside, N.Y. 11361

Filed May 20, 1976, Ser. No. 688,179
Int. Cl.[2] A61C *13/08*
U.S. Cl. 264—19 **15 Claims**

15. A method for forming a unitary tooth die and stem integral with and removable from a dental stone model comprising

positioning a casting member having a hollow interior over and in alignment with and spaced from a negative impression of a denture having a cavity of a selected tooth to be reproduced,

pouring a dental molding material into the negative impression and into the hollow of the casting member and cavity to form the stem of a tooth die that is integral with the tooth die reproduction formed by the material in the cavity of the selected tooth,



allowing the molding material to harden into a dental stone model,

relieving the dental stone model to provide access to a part of the die stem,

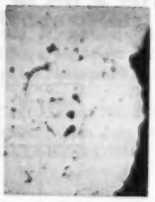
and applying a force to the accessible part of the die stem to cleave and separate the unitary tooth die and stem from the casting member and dental stone model.

4,056,586

METHOD OF PREPARING MOLTEN METAL FILTER

Michael J. Pryor, Woodbridge, Conn., and Thomas J. Gray, Halifax, Canada, assignors to Swiss Aluminium Limited, Chippis, Switzerland

Division of Ser. No. 430,229, Jan. 2, 1974, Pat. No. 3,893,917.
This application Dec. 4, 1974, Ser. No. 529,452
Int. Cl.[2] C04B *33/32*
U.S. Cl. 264—44 **8 Claims**



1. A method of preparing a disposable filter for filtering molten metal which comprises:

A. providing an open cell flexible organic foam material having a thickness of from ¼ inch to 4 inches and having a plurality of interconnected voids surrounded by a web of said material, wherein said foam contains from 5 to 100 pores per inch;

B. providing an aqueous ceramic slurry containing from about 10 to 40% water, wherein said ceramic is selected from the group consisting of alumina, chromia, zirconia, magnesia, titanium dioxide, silica and mixtures thereof, and impregnating said material therewith by immersing said material in said aqueous ceramic slurry so that the web is coated therewith and the voids are filled therewith;

C. compressing the impregnated material and releasing the compression by passing said impregnated material through preset rollers to expel from 25 to 75% of said slurry therefrom while leaving the web coated therewith;

D. forming said slurry coated flexible foam into a desired curved configuration, drying said material while in said configuration and retaining said material in said configuration throughout the drying step; and

E. heating the dried material to burn off the web of flexible foam and to sinter the ceramic coating while avoiding collapse thereof, wherein the dried impregnated material

is heated in two stages, with the first stage being to slowly heat at a rate less than 10° C per minute to a temperature of from 350° to 700° C and hold within said temperature range for from 15 minutes to 6 hours to burn off the web of flexible foam, and with the second stage being to heat at a rate less than 100° C per minute to a temperature of from 1200° to 1600° C and hold within said temperature range for from 15 minutes to 10 hours to sinter the ceramic and wherein said dried material is retained in said configuration throughout said heating step,

thereby providing a fused ceramic foam having a desired curved configuration and having a plurality of interconnected voids surrounded by a web of fused ceramic in the configuration of said flexible foam, wherein the resultant fused ceramic foam has a density of less than 30% of the theoretical density for a ceramic material of the same size.

4,056,587

PROCESS FOR EXPANDING

Arvid Honkanen, Spartanburg, and Paul Joonase, Taylors, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Oct. 20, 1975, Ser. No. 624,152
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—53 **27 Claims**

CONTACTING FOAMED STYRENE SHEET WITH AQUEOUS COMPOSITION
PROVIDING CONTACT TO IMPREGNATE SHEET WITH AQUEOUS COMPOSITION
HEATING THE IMPREGNATED SHEET TO THE SOFTENING POINT TO EXPAND THE SAME

1. A process for further expanding a previously expanded styrene polymer foam sheet comprising the steps of:

impregnating the previously expanded styrene polymer foam sheet with an aqueous composition to the extent of at least 0.3 parts of aqueous composition per 100 parts of styrene polymer; and

heating the thus impregnated sheet to at least the softening point of said styrene polymer to soften said polymer and to volatilize said aqueous composition within the porosity of said foam sheet to thus expand said foam sheet by the action of said volatilized aqueous composition to a greater extent than any expansion which would be produced in the absence of said aqueous composition.

4,056,588

BONDED PARTICULATE CERAMIC MATERIALS AND THEIR MANUFACTURE

Avraham Matitiahu Baniel, Haifa; Abraham Mitzmager, Kirlat Bialik; Jeanna Segall, Haifa; Shlomo Star, Haifa, and Leonard Marshall Shorr, Haifa, all of Israel, assignors to IMI (TAMI) Institute for Research and Development, Haifa, Israel

Continuation-in-part of Ser. No. 230,998, March 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 814,432, April 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 518,792, Jan. 5, 1966, abandoned. This application Mar. 13, 1974, Ser. No. 450,558
Int. Cl.[2] C04B *35/64*
U.S. Cl. 264—63 **5 Claims**

1. A method for the manufacture of self-bonded bodies from particulate materials selected from the group consisting of oxides of magnesium, silicon, aluminum, zirconium, beryllium, thorium, cerium, titanium, chromium, iron; metal aluminates, titanates, ferrites, and silicates; and carbides of silicon, tungsten, titanium, boron and tantalum characterized in that a shaped mixture containing the particulate material, from 0 to 6% of its weight of water, and from 1 to 10% of its weight of a heat-decomposable additive is subjected to initial green-strength providing conditions in which the additive is substantially not reactive towards any of the other ingredients of the mixture, then heated to a temperature within the range from about 200° C to about 600° C, at which the additive is thermally decomposed and bonding of said particulate material is effected, to form low strength bonded bodies, and then further heated to a higher temperature at which the particles of the particulate material become self-bonding, said additive being characterized by not boiling below 350° C at 760 mm/Hg, and being thermally decomposed at said temperature range from about 200° C to about 600° C to produce a non-volatile inorganic residue amounting to at least 5% of the original weight of the additive, said additive being an organo-phosphorus compound having a non-polymeric inorganic moiety and corresponding to the formula

$$M(A_z \text{ or } {}_{x+1}Q_x)\,(A'R)_y(R')_z$$

wherein,

M is an element selected from the group consisting of metals and silicon;

A and A′ are each O, S or N;

Q is P, P═O or P═S;

R and R′ are each H, or a hydrocarbon, substituted hydrocarbon, organo-metallyl or-metalloxy radical, and R′ may also be halogen; *x* and *z* are each an integer from zero to 5; *x*′ is an integer from 1 to 5, and *y* is an integer from zero to 8, provided that *y* and *z* may not both be zero, and A′R and/or R′ can be bonded either to M or Q and there may be more than one type of A′R and/or R′ groups in the molecule.

4,056,589

METHOD FOR SINTERING CERAMICS

James N. Lingscheit, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 18, 1976, Ser. No. 658,982
Int. Cl.[2] C04B *35/10*
U.S. Cl. 264—65 **12 Claims**

1. A method for sintering a green ceramic body comprised of polycrystalline bi- or multi-metal oxides comprising:

A. encapsulating said body in a chamber having inner and outer wall portions, said inner wall portion being

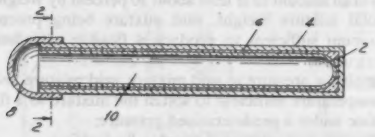
i. adjacent to said body being sintered and

ii. comprised of a sintered polycrystalline bi- or multi-metal oxide composition of the same type as said body being sintered such that upon heating during the sintering process volatile metal oxide constituents of said

composition create an atmosphere of said constituents which surrounds said body being sintered, and

said outer wall portion being

i. adjacent to, contiguous with and integrally bonded to the entire outer surface of said inner wall portion and



ii. comprised of a substantially impervious sintered ceramic which is essentially nonreactive with said polycrystalline bi- or multi-metal oxides; and

B. heating said chamber with said body encapsulated therein to a temperature and for a time necessary to sinter said body to the desired density.

4,056,590

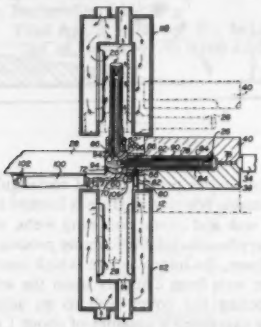
BLOW MOLDING METHOD WITH DOUBLE CYCLE FOR CORE RODS

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Division of Ser. No. 476,092, June 3, 1974, Pat. No. 3,923,441. This application Nov. 5, 1975, Ser. No. 628,881

Int. Cl.² B29C *17/07*

U.S. Cl. 264—89 **13 Claims**



1. The method of making blow molded articles by injection molding a parison on a core rod, blow molding the parison to form a hollow article, and stripping the article from the core rod comprising, moving successive parison covered cored rods in a temperature conditioning cycle along a course past an injection molding station, a blowing station and a stripping station, said stations being in a common plane and said temperature conditioning cycle being in a plane other than said common plane, each core rod after injection molding being moved along the course past the blowing and stripping stations and past the station at which the parison was injection molded without interaction with any of these stations, and, then with other core rods indexed for operation at said stations, shifting the position of the temperature conditioned parison covered core rod to said common plane and then moving the temperature conditioned parison covered core rod in another cycle into active cooperation with the blowing station to form said article and stripping station to remove said article from the core rod.

4,056,591

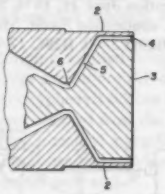
PROCESS FOR CONTROLLING ORIENTATION OF DISCONTINUOUS FIBER IN A FIBER-REINFORCED PRODUCT FORMED BY EXTRUSION

Lloyd A. Goettler, and James Lambright, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 428,219, Dec. 26, 1973, abandoned. This application Feb. 2, 1976, Ser. No. 654,547

Int. Cl.² B29D *3/02*

U.S. Cl. 264—108 **27 Claims**



1. In the process for the off-axis orientation of fiber in a matrix by dividing a mixture of organic polymer and discontinuous fiber and extruding it through a die channel having inner and outer surfaces and intervening space substantially filled by the mixture, the improvement which comprises effecting off-axis orientation primarily by having said inner and outer surfaces diverge from the axis of the die such that the distance of each surface from said axis is greater at the channel outlet than at the channel inlet and (A_o/A_i) is 2 or more where A_o is the channel outlet area and A_i is the channel inlet area, said inner and outer surfaces being substantially stationary.

4,056,592

PROCESS FOR PREPARATION OF THERMOSETTING RESIN POWDER PAINTS

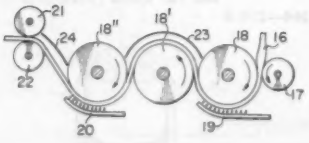
Ryoji Izumi, Neyagawa; Shoji Kobayashi, Akashi; Toshiharu Ono, Suita; Toru Shirato, Hiroshima; Akiyoshi Fujii, Hiroshima, and Tadashi Okihara, Hiroshima, all of Japan, assignors to Dai Nippon Toryo Co., Ltd. and The Japan Steel Works Ltd., both of, Japan

Filed July 7, 1975, Ser. No. 593,875

Claims priority, application Japan, July 11, 1974, 49-79548

Int. Cl.² B29B *1/02*

U.S. Cl. 264—141 **4 Claims**



1. A process for the production of thermosetting resin powder paints which consists of the steps (1) melting and kneading a thermosetting resinous composition which contains curing agents at a temperature higher than the softening point but lower than the curing point of the resinous composition, extruding said thermosetting resinous composition for a powder paint in the molten state from an extruder die, at temperature between 90° C and 140° C, at a rate between 100 and 600 kg/hr. (2) continuously cooling the extruded composition and forming it into a sheet under conditions to avoid curing of the resin by means of a plurality of rolls including press rolls for rolling the composition into a sheet, cooling feed rolls and withdrawal take-up rolls disposed in this order, applying air from air blasting nozzles, which nozzles are opened to face the entire surfaces of the cooling feed rolls, at a distance from the cooling feed rolls of between 20 and 150mm, at an air rate of at least 30m/sec, at a pressure of between 1.5 and4kg/cm² while con-

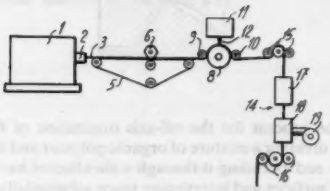
trolling the sheet temperature at the terminal portion of the withdrawal take-up rolls between room temperature and 50° C, and (3) pulverizing the so formed sheet.

4,056,593

METHOD OF MAKING A FASTENER

José Luis de Navas Albareda, Barcelone, Spain, assignor to Repla International S.A.H., Luxembourg

Continuation of Ser. No. 235,315, March 16, 1972, abandoned. This application June 21, 1974, Ser. No. 481,741
Claims priority, application Spain, Mar. 26, 1971, 389609
Int. Cl.[2] B29D *5/00*; B29C *17/08*; B29F *3/00*
U.S. Cl. 264—145 **4 Claims**



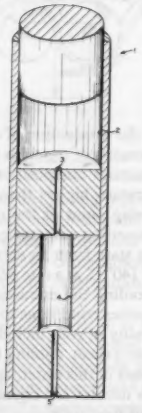
1. A method of manufacturing a strip including fastener projections to form in combination with a similar strip a closure member, the steps consisting of extruding a strip of synthetic resin having longitudinal ribs on at least one of its faces, passing said strip beneath a forming member to deform the ribs on said upper face and thereby vary the height and width of the ribs throughout the length of said strip, passing the strip partially around a roller disposed beneath a cutting member, actuating said cutting member to cut transverse spaces in said ribs, passing the strip through a heating zone and cooling the thus formed strip.

4,056,594

METHOD OF PRODUCING A FLEXIBLE EXTRUDATE OF A MIXTURE OF POLY(PHENYLENE SULFIDE) AND FILLER

Guy E. Carrow, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 15, 1975, Ser. No. 640,984
Int. Cl.[2] C08G *75/14*
U.S. Cl. 264—176 R **4 Claims**



1. A method for producing an extrudate of a poly(phenylene sulfide) mixture having a stiffness of less than 10,000 psi as measured by ASTM D 747-70, said method comprising:

a. precuring a mixture of poly(phenylene sulfide and at least one filler, at least one of said fillers is polytetrafluoroethylene in an amount of at least about 20 percent by weight of the total mixture weight and said poly(phenylene sulfide) is in an amount of at least about 30 percent by weight of the total mixture weight, said mixture being precured an amount sufficient to produce a flexible extrudate upon extrusion;

b. applying pressure to said mixture, said mixture being at a temperature sufficient to soften the mixture to a flowable state under a predetermined pressure;

c. flowing said mixture through a first orifice;

d. flowing said mixture from said first orifice through an expansion chamber which is in downstream communication with said first orifice; and

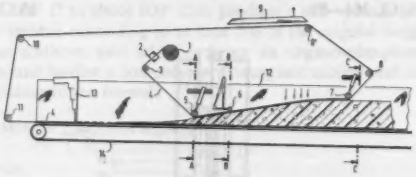
e. flowing said mixture from the expansion chamber through a second orifice which is in downstream communication with said expansion chamber, said expansion chamber having a cross-sectional area about 10 times larger in area than the first and second orifices.

4,056,595

PROCESS FOR PRODUCING FOAM SLABS OF RECTANGULAR CROSS-SECTION

Horst Bokelmann, Bad Wildungen, Germany, assignor to Metzeler Schaum GmbH, Memmingen, Germany

Filed Apr. 13, 1976, Ser. No. 676,603
Claims priority, application Germany, Apr. 22, 1975, 2517664
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—46.3 **8 Claims**



1. In the continuous production of rectangular foam slabs wherein a foamable reaction mixture is foamed on a forwardly moving floor web and lateral confining webs, and in which a cover web is applied during the foaming process to the surface of the rising foam, the improvement which comprises supplying said cover web from a supply upon the still liquid foam surface, subjecting the cover web to an adjustable tensile stress, thereby exercising a pressure of about 1 to 6 Kg/m^2 on the surface of the rising foam, removing the cover web from the foam surface beyond the point at which the rising mixture has substantially reached its maximum height, and passing the web rearwardly and then forwardly to serve as the floor web for receiving further foamable mixture.

4,056,596

CONTINUOUS METHOD FOR MAKING HOSE WITH DESTRUCTION OF MANDREL

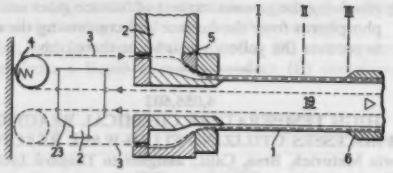
Karl-Heinz Pahl, Dusseldorf-Lohausen, Germany, assignor to Pahl'Sche Gummi-und Asbest-Gesellschaft "Paguag", Dusseldorf, Germany

Filed May 7, 1976, Ser. No. 684,347
Claims priority, application Germany, May 10, 1975, 2520853
Int. Cl.[2] B29C *1/06, 1/08*; B29D *23/00*; B29H *7/14*
U.S. Cl. 264—166 **9 Claims**

1. In a method in which a hose of vulcanizable material is continuously formed on a hollow, destructible mandrel, the improvement comprising:

continuously forming and advancing said mandrel and con-

tinuously vulcanizing said hose while advancing said hose in an axial direction with said mandrel; after a portion of said hose has been vulcanized on a portion of said mandrel, continuously destroying said portion of said mandrel within said hose and removing remnants of said mandrel



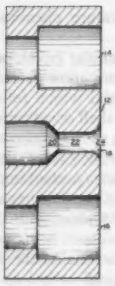
from said hose, the destroying and removing steps including longitudinally severing said mandrel into a plurality of strips, flexing said strips and carrying said strips back within the hollow mandrel, breaking down said strips into their components and recycling the components of the mandrel strips to the mandrel forming stage.

4,056,597

PROCESS AND DIE FOR EXTRUSION OF A RESINOUS MATERIAL

Earl D. Cooper, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 3, 1975, Ser. No. 564,685
Int. Cl.² D01D *1/10*; B28B *21/54*
U.S. Cl. 264—169 **7 Claims**



1. A process comprising:

extruding a resinous material selected from the group consisting of polyethylene, polypropylene, polystyrene and styrene-butadiene copolymers through an orifice in a die to produce a strand, said orifice comprising an inlet zone, a cylindrical zone and an outlet zone, in that order;

said inlet zone converging in the direction of flow of said resinous material and attached to one end of said cylindrical zone; and

said outlet zone having a shape resembling a portion of the area circumscribed by a torus wherein the radius of curvature is in the range of from about ½ to 2 times the radius of the strand produced, diverging in the direction of flow of said resinous material and attached to the other end of said cylindrical zone.

4,056,598

PROCESS FOR FORMING FILAMENTS FROM POLYAMIC ACID

Francis S. Galasso, Manchester; Romeo G. Bourdeau, South Windsor, and Roscoe A. Pike, Simsbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 11, 1974, Ser. No. 531,633
Int. Cl.² D01F *7/00*
U.S. Cl. 264—184 **4 Claims**

1. A process for producing continuous by filaments of uniform diameter from polyamic acid suitable for conversion to polyimide filaments a condensation reaction mechanism comprising:

providing a fiber-forming solution consisting essentially of essentially equimolar amounts of P,P-diaminophenyl ether and bis-(3,4-dicarboxyphenyl) sulfone dianhydride, and an amount of a solvent selected from the group consisting of dimethyformamide, n-methyl pyrrolidone and mixtures thereof sufficient to cause said solution to have a viscosity of 500 to 5,000 centipoises; and

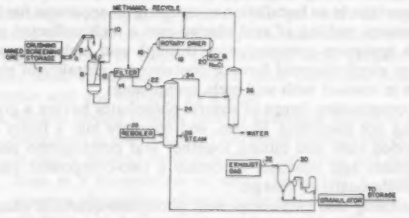
forming filaments by extruding said starting solution in a coagulating liquid consisting essentially of a liquid selected from the group consisting of propanol, methyl alcohol, ethyl alcohol, butyl alcohol, a mixture of ethyl alcohol and propanol and a mixture of methyl alcohol and acetone.

4,056,599

PROCESS FOR THE RECOVERY OF MAGNESIUM CHLORIDE HYDRATE AND POTASSIUM CHLORIDE FROM CARNALLITE AND BISCHOFITE

Joseph M. Fox, III, Lafayette; Bruce D. Degen, Bolinas, and Irving Leibson, Alamo, all of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Filed Oct. 20, 1975, Ser. No. 624,028
Int. Cl.² C01F *5/30*
U.S. Cl. 423—178 **23 Claims**



8. A process for recovering magnesium chloride hydrate from carnallite comprising the steps of dissolving the magnesium chloride hydrate in a lower saturated monohydric aliphatic alcohol having from one to four carbon atoms by contacting the carnallite with the alcohol, injecting water into the solution, and evaporating the alcohol from the solution, the step of injecting the water being performed before a major portion of the alcohol has been evaporated.

17. A process for the recovery of magnesium chloride hydrate from carnallite comprising the steps of contacting the carnallite with a lower saturated monohydric aliphatic alcohol having from one to four carbon atoms to thereby dissolve the magnesium chloride hydrate in the alcohol, and removing from the solution substantially all of the alcohol and substituting therefor a sufficient amount of water to form an aqueous magnesium chloride hydrate brine.

4,056,600

METHOD OF SELECTIVE CATALYTIC PURIFICATION OF WASTE GASES FROM NITROGEN OXIDES

Gennady Alexeevich Skvortsov, ulitsa Kima, 32, kv. 50; Nellya Nikitichna Nizeeva, ulitsa Lermontova, 17, kv. 4; Avrum Iosifovich Podzharsky, ulitsa Juzhnaya, 12, kv. 10, and Irma Viktorovna Dobrovolskaya, ulitsa Prokhodnoi tupik, 3, kv. 2-a, all of Dneprodzerzhinsk Dnepropetrovskoi oblasti, U.S.S.R.

Continuation of Ser. No. 476,045, June 3, 1974, abandoned. This application Feb. 16, 1977, Ser. No. 769,214

Int. Cl.[2] B01D *53/00*

U.S. Cl. 423—239 5 Claims

1. Method of selectively removing nitrogen oxides from waste gases by reducing said nitrogen oxides with ammonia, which comprises a waste gas containing nitrogen oxides in admixture with a substantially stoichiometric amount of gaseous ammonia through a catalyst at a temperature of 100° – 500° C, at a volumetric velocity of passage of 5000 – 100,000 hour and a volumetric ratio of the gaseous ammonia to nitrogen oxides of 0.7 – 1.5, said catalyst consisting essentially of a mixture of oxides of vanadium and manganese applied to an inert carrier said oxides being taken in a weight ratio of V_2O_5/Mn_2O_3 of 0.1 – 30, the total content of said oxides of vanadium and manganese being 5–40 percent of the total weight of the catalyst, whereby substantially all of the nitrogen oxides are reduced to nitrogen and the waste gas is thus purified of nitrogen oxides.

4,056,601

PROCESS FOR THE PRODUCTION OF YELLOW PHOSPHORUS

Semen Issakovich Volfkovich, Vystavochny pereulok, 3, kv. 12, Moscow; Vladimir Nikolaevich Belov, Bolsheokhtinsky prospekt, 3, kv. 305; Vadim Andreevich Ershov, prospekt Veteranov, 105, kv. 29, both of Leningrad; Evgeny Khaskelevich Rozenberg, Novokhoroshevskoe shosse, 31, korpus 2, kv. 36; Emmanuil Ivanovich Shipov, Izumrudnaya ulitsa, 50, kv. 134, both of Moscow, and Ljudmila Vladimirovna Jumanova, Otdelny pereulok, 5a, kv. 13, Sverdlovsk, all of U.S.S.R.

Filed Aug. 4, 1975, Ser. No. 601,468

Int. Cl.[2] C01B *25/01, 25/02, 25/04*

U.S. Cl. 423—322 14 Claims

1. A process for the production of yellow phosphorus from a charge consisting essentially of natural phosphates and mineral quartzite in an installation comprising an apparatus for the preliminary melting of said charge into a melt collector and which apparatus communicates, through said melt collector, with an electrothermal furnace containing a plurality of electrodes in contact with said melt, comprising:

a. comminuting lumps of natural phosphates having a grading not exceeding 10 mm. and quartzite into a finely divided state and mixing together said comminuted phosphates and quartzite to obtain a two-component phosphate-quartzite charge;

b. melting said two-component phosphate-quartzite charge using fuel combustion products in said apparatus for preliminary melting of the charge;

c. treating the resulting phosphate-quartzite melt, while flowing down the apparatus walls in a thin layer, with overheated steam obtained from moisture contained in said fuel combustion products to form fluorine compounds;

d. removing the fluorine compounds and the fuel combustion products from the installation;

e. continuously feeding the remaining defluorinated melt through said melt collector into said electrothermal furnace;

f. concurrently with the above steps, feeding to the surface of the melt in the electrothermal furnace a three-component charge preliminarily obtained by mixing heat-treated lump phosphate and quartzite having a grading of about from 10–50 mm., together with a reducing agent having a grading of about from 5–25 mm., while, also concurrently, feeding a comminuted reducing agent into the melt layer under pressure, whereby the phosphates in the melt are reduced to yellow phosphorous in gaseous form, together with the formation of furnace gases containing carbon oxide, slag, and ferrophosphorus;

g. removing the formed slag and ferrophosphorus from the installation; and

h. removing the gaseous mixture of furnace gases and yellow phosphorus from the furnace and condensing the mixture to recover the yellow phosphorus thereform.

4,056,602

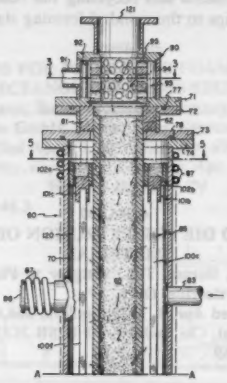
HIGH TEMPERATURE CHEMICAL REACTION PROCESSES UTILIZING FLUID-WALL REACTORS

Edwin Matovich, Brea, Calif., assignor to Thagard Technology Company, Irvine, Calif.

Continuation-in-part of Ser. No. 606,222, Aug. 20, 1975, Ser. No. 591,949, June 30, 1975, and Ser. No. 271,560, July 13, 1972, Pat. No. 3,933,434. This application Sept. 24, 1975, Ser. No. 616,393

Int. Cl.[2] C01B *31/36;* C10G *9/42*

U.S. Cl. 423—345 21 Claims



1. A high temperature chemical reaction process which comprises:

a. generating an annular envelope of an inert fluid which is substantially transparent to radiation within a shell of a refractory material which reflects radiation, the volume enclosed by the shell constituting a black body cavity, the envelope having substantial axial length and the interior of the envelope defining a reaction chamber;

b. passing at least one reactant into the black body cavity and through the reaction chamber along a predetermined path substantially coincident with the longitudinal axis of the envelope, the reactants being confined within the reaction chamber, at least one of the reactants being a carbonaceous material; and

c. directing high intensity radiant energy into the reaction chamber to coincide with at least a portion of the predetermined path of the reactants, sufficient radiant energy being absorbed within the reaction chamber to raise the temperature of the reactants to a level required to initiate and sustain the desired chemical reaction.

4,056,603

PROCESS FOR INCREASING AMMONIA PRODUCTION

Sidney A. Bresler, New York, N.Y., assignor to Bresler and Associates, Inc., New York, N.Y.

Filed June 14, 1976, Ser. No. 695,457

Int. Cl.[2] C01C *1/04*

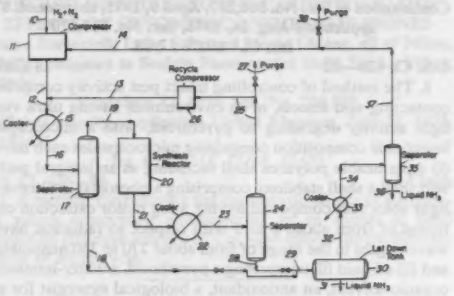
U.S. Cl. 423—359 6 Claims

1. A process for the synthesis of ammonia from hydrogen and nitrogen, at least one of which is contaminated with at

least one inert gas selected from the group consisting of argon and methane, which consists essentially of the following sequence:

contacting said hydrogen and nitrogen, together with recycled mixtures (C) and (E), described below, in a converter with an ammonia synthesis catalyst at elevated temperature and elevated pressure to form a gaseous reaction mixture (A) containing ammonia, unreacted hydrogen, unreacted nitrogen and inert gas contaminant,

cooling said gaseous reaction mixture (A) and separating therefrom a liquid ammonia product (B) containing a



portion of the unreacted hydrogen, unreacted nitrogen and inert gas contaminant therein,

recycling the gaseous remainder (C) of said gaseous reaction mixture (A) to said converter, reducing the pressure of said liquid ammonia product (B) and separating therefrom liquid ammonia (D) and a gaseous mixture (E) containing unreacted hydrogen, unreacted nitrogen, ammonia and inert gas contaminant, and

recycling a substantial portion of said gaseous mixture (E) without removing therefrom said inert gas contaminant to said converter.

4,056,604

PRODUCTION OF HYDROGEN FLUORIDE

William Henry Thompson, 22 Crannagh Park, Dublin 14; Ralph Eric Worthington, 16 Woodbine Road, Blackrock Co. Dublin, and David John Stamper, 15 Bayside Walk, Sutton Co. Dublin, all of Ireland

Filed Aug. 20, 1973, Ser. No. 389,572

Claims priority, application United Kingdom, Aug. 24, 1972, 39400/72; Jan. 29, 1973, 4373/73; Apr. 24, 1973, 19378/73; May 21, 1973, 24149/73

Int. Cl.² C01B 7/22; C01D 3/02

U.S. Cl. 423—483 **12 Claims**

1. A process for the preparation of hydrogen fluoride, the process comprising heating ammonium fluoride in an aqueous solution, in the presence of an amount of a soluble alkali metal fluoride in excess of the stoichiometric amount for reacting to form an aqueous solution of the bifluoride of the alkali metal, such that the weight ratio of fluoride ions to ammonium ions in solution is at least 3 : 1, whereby the rate of reaction to form the bifluroide is increased, and recovering a solid product from the solution comprising alkali metal bifluoride, substantially free from ammonia, and decomposing the alkali metal bifluoride by heating the solid product to release hydrogen fluoride and to form metal fluoride.

4,056,605

METHOD FOR PURIFICATION OF HYDROFLUORIC ACID

Alexandr Ilich Vulikh, ulitsa Khalturina, 5ª, kv. 93; Maina Konstantinovna Zagorskaya, ulitsa Khalturina, 5ª, kv. 93, both of Ryazan; Izrail Zalmanovich Kofman, ulitsa Bazhova, 8, kv. 5, Sverdlovskaya oblast, Polevskoi; Inna Vasilievna Pavlovich, ulitsa Kultury, 12, kv. 7, Sverdlovskaya oblast, Polevskoi; Boris Veniaminovich Levitan, ulitsa Kultury, 10, kv. 14, Sverdlovskaya oblast, Polevskoi; Nikolai Vasilievich Troyan, ulitsa Kultury, 10, kv. 10, Sverdlovskaya oblast, Polevskoi, and Sergei Viktorovich Dubyaga, ulitsa Karla Marxa, 7, kv. 7, Sverdlovskaya oblast, Polevskoi, all of U.S.S.R.

Filed Nov. 23, 1976, Ser. No. 744,296

Int. Cl.² C01B 7/22; C01C 1/24; C01B 33/00

U.S. Cl. 423—484 **7 Claims**

1. A method for purification of hydrofluoric acid from acids selected from the group consisting of silicofluoric and sulphuric acids which comprises contacting a mixture of said acids with an anion-exchange resin in the fluoride form thereof to obtain a purified hydrofluoric acid; treating the exhausted anion-exchange resin with a regenerating solution comprising an aqueous solution of ammonium fluoride having a concentration ranging from 2 to 10% by weight and a pH value ranging from 6 to 9.

4,056,606

DESULFURIZATION OF WASTE GASES CONTAINING HYDROGEN SULFIDE

Rolf Germerdonk, Schildgen; Adam Jonas, Leichlingen; Dieter Hüllstrung, and Bernhard Scherhag, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 25, 1976, Ser. No. 689,876

Claims priority, application Germany, May 30, 1975, 2524124; Apr. 21, 1976, 2617311

Int. Cl.² C01B 17/04

U.S. Cl. 423—575 **10 Claims**

1. A process for removing hydrogen sulfide from a gas containing it comprising treating the gas with an aqueous solution of at least one organic polybasic acid selected from the group consisting of oxalic acid, malonic acid, glutaric acid, adipic acid, maleic acid, fumaric acid, citraconic acid and phthalic acid and buffered by a base,

a. the gas having a molar ratio of hydrogen sulfide to sulfur dioxide of at least about 2:1 and being brought into contact in finely divided form in a first absorption and reaction zone at a temperature of about 10 to 100° C with the aqueous absorption solution buffered by the base to a pH of about 2 to 6, thereby to produce solid sulfur;

b. the sulfur accumulating in solid form from the solution being removed from at least a component stream of the solution;

c. the gas leaving stage (a) being heated to a temperature of about 700° to 1000° C, thereby converting the sulfur compounds present in the gas into sulfur dioxide and oxidizing any organic compounds present into carbon dioxide and water;

d. SO_2-containing smoke gas from stage (c) being recycled to stage (a);

e. the balance of the smoke gas component stream from (c) being treated in a second absorption stage (e) with the solution leaving stage (b) for the substantially quantitative absorption of SO_2, and

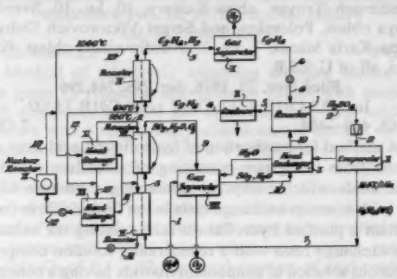
f. the SO_2-containing solution from stage (e) being recycled to stage (a).

4,056,607

THERMOCHEMICAL PROCESS FOR THE PRODUCTION OF HYDROGEN AND OXYGEN FROM WATER

Friedrich F. Behr, Gross-Denkte, Germany, assignor to Rheinische Braunkohlenwerke AG, Cologne, Germany

Filed Jan. 4, 1977, Ser. No. 756,728
Claims priority, application Germany, Jan. 9, 1976, 2600666
Int. Cl.[2] C01B *1/16, 1/28, 13/00*
U.S. Cl. 423—579 5 Claims



1. A process for the production of hydrogen and oxygen from water in a thermochemical, closed circulation process comprising:

a. reacting sulfur dioxide, water and an olefin in the presence of catalytically active quantities of iodine in an exothermic reaction at temperatures of about 200°–350° C and pressures of about 20–300 atmospheres to produce sulfuric acid and a paraffin hydrocarbon corresponding to said olefin;

b. decomposing the sulfuric acid at temperatures of about 600°–950° C into sulfur dioxide, water and oxygen;

c. decomposing said paraffin hydrocarbon into hydrogen and the corresponding olefin at temperatures of about 500°–750° C;

d. recycling into the exothermic reaction of step (a) the sulfur dioxide and water formed in step (b) and the olefin formed in step (c); and

e. collecting and removing hydrogen and oxygen formed in steps (c) and (b), respectively.

4,056,608

CARDIAC GLYCOSIDE OR AGLYCONE ASSAYS

Edwin F. Ullman, Atherton; Joyce Y. Chang, Sunnyvale, and Kenneth G. McNeil, Santa Clara, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Apr. 8, 1976, Ser. No. 674,782
Int. Cl.[2] G01N *33/00;* G21H *5/02*
U.S. Cl. 424—1 9 Claims

1. In an immunoassay for the determination of cardiac glycosides or aglycones employing a serium sample, wherein antibody for cardiac glycosides or aglycones is employed which binds to cardiac glycosides or aglycones in competition with the indicator used for detection, the improvement which comprises:

pre-treating said serum sample with an alkaline solution under mild conditions at a pH of at least about 10.5.

4,056,609

ARTICLE FOR DIAGNOSIS OF ACHLORHYDRIA

Michael A. Kirchubel, San Francisco, Calif., assignor to Gunn, Kirchubel & Miller, San Francisco, Calif.

Filed Jan. 28, 1976, Ser. No. 653,000
Int. Cl.[2] A61K *43/00, 29/00;* G01N *31/00, 33/00*
U.S. Cl. 424—1 22 Claims

1. An article useful to detect stomach acid comprising a detection agent enclosed in a fluid-impervious entrapping medium with said entrapping medium including a degradable element that is degradable at pH lower than 6, with said degradable element sealing said entrapping medium whereby when said degradable element is degraded, said detection agent is released from said entrapping medium.

21. The article of claim 1 wherein said detection agent is a radioactive material.

4,056,610

MICROCAPSULE INSECTICIDE COMPOSITION

Loren L. Barber, Jr., Woodbury; Anthony J. Lucas, Oakdale, and Richard Y. Wen, New Brighton, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 566,287, April 9, 1975, abandoned. This application Aug. 24, 1976, Ser. No. 717,170
Int. Cl.[2] A01N *17/08*
U.S. Cl. 424—32 18 Claims

1. The method of controlling insect pest activity comprising contacting said insects, in an environment having ultra violet light activity degrading to pyrethroid, with a microcapsule insecticide composition comprising microcapsules each having (i) a permeable polyurea shell including as an integral part of said shell a shell stabilizer comprising a photostable ultraviolet light absorbent compound having a log molor extinction coefficient of from about 2 to 5 with respect to radiation having wavelengths in the range of from about 270 to 350 nanometers, and (ii) a liquid fill comprising a pyrethroid, a water-immiscible organic solvent, an antioxidant, a biological synergist for said pyrethroid and a fill stabilizer comprising a photostable ultraviolet light absorbent compound having a log molar extinction coefficient of from about 2 to 5 with respect to radiation having wavelengths in the range of from about 270 to 350 nanometers; wherein said liquid fill permeates said porous polyurea shell over a sustained period of time and maintains an insecticidally effective level of pyrethroid upon the outer surface of the shell wall for an extended period of time.

4,056,611

THERAPEUTIC COMPOSITION

Henry Y. Young, Delmar, N.Y., assignor to Stiefel Laboratories, Inc., Oak Hill, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,773
Int. Cl.[2] A61K *7/135*
U.S. Cl. 424—62 9 Claims

1. A therapeutic composition for the treatment of acne consisting of a stable dispersion of finely divided particles of benzoyl peroxide in an aqueous alcohol vehicle, said aqueous alcohol vehicle being a single non-lipid phase consisting essentially of a solution of water and an alkyl alcohol having from 1 to 3 carbon atoms and in which solution is dissolved a non-ionic surface active agent, the hydrophilic portion of which is a polyoxyalkylene moiety wherein each oxyalkylene group contains from 2 to 3 carbon atoms, said surface active agent being soluble in said solution, said composition containing from about 1 to 30 percent by weight benzoyl peroxide having a particle size of less than 100 microns, from about 1 to 30 percent by weight of a surface active agent, from about 10 to 80 percent by weight of said alkyl alcohol, and from about 10 to 80 percent by weight of water.

4,056,612

AIR FRESHENER GELS

Chii-Fa Lin, Tarrytown, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 453,442, March 21, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,553
Int. Cl.[2] A61L *13/00*
U.S. Cl. 424—76 16 Claims

1. In an air freshener gel consisting essentially of about 1.5 to 4% of a gelling agent, and about 98.5 to 96% of an aqueous medium containing a volatile air freshener component; the improvement which comprises a gelling agent comprising:

a. from about 0.6 to about 2% of a carrageenan of which at least 40% by weight is the kappa fraction,
b. from about 0.2 to about 1.0% of locust bean gum; and
c. from about 0.05 to about 1.0% of a water soluble ammonium salt having a pH greater than about 5.0 selected from the group consisting of ammonium chloride, ammonium sulfate, ammonium acetate, ammonium phosphate (dibasic) and mixtures thereof,

wherein said percent is percent by weight of said air freshener gel.

4,056,613

METHOD OF REDUCING THE CARDIOTOXIC SIDE EFFECTS OF GLYCOSIDIC ANTHRACYCLINONES

Cesare Bertazzoli; Luisa Sala, and Mario Ghione, all of Milan, Italy, assignors to Societa Farmaceutici Italia S.p.A., Milan, Italy

Filed July 12, 1976, Ser. No. 704,508
Claims priority, application United Kingdom, July 21, 1975, 32152/75
Int. Cl.[2] A61K *37/48, 31/70*
U.S. Cl. 424—94 1 Claim

1. A method for reducing the cardiotoxic effects of adriamycin which comprising administering to an animal in need thereof an effective amount of CoQ_{10} to inhibit the cardiotoxic effects of adriamycin.

4,056,614

IMMUNITY DEPRESSANT MEDICINE

Marc Bonneau, 18, rue de Tourville, 69005 Lyon, and Mireille Latour, 23, Les Sabines, 69130 Ecully, both of France

Continuation-in-part of Ser. No. 399,496, Sept. 21, 1973, abandoned. This application Dec. 1, 1975, Ser. No. 636,611
Claims priority, application France, Sept. 22, 1972, 72.33703
Int. Cl.[2] A61K *35/50, 39/00*
U.S. Cl. 424—105 16 Claims

1. A process for extracting immuno-depressive gamma-globulins from human placental tissue which has been ground or powdered comprising the following steps:
a. Washing the ground placental tissue to remove serous substances therefrom;
b. Eluting the placental tissues, freed of serous substances, with a buffer solution to form an eluate; and freeing the eluate of any tissue material and precipitates wherein the elution of the placental tissue is undertaken at a pH of about between 2 and 3.5 with said buffer solution and at a temperature ranging between about 10° to 38° C;
c. Adding ethanol to said eluate to precipitate the immuno-depressive gamma-globulins; and
d. Dialyzing the immuno-depressive gamma-globulins with water.

4,056,615

LUCKNOMYCIN AND PROCESS FOR PRODUCING SAME

Vinay Chhotalal Vora, Lucknow, and Amrut Vithaldas Mody, Bombay, both of India, assignors to U C B Societe Anonyme, Brussels, Belgium

Filed May 24, 1976, Ser. No. 689,145
Claims priority, application United Kingdom, May 28, 1975, 23342/75
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—120 7 Claims

1. Lucknomycin, an antifungal and antiprotozoal antibiotic, which:
a. is an orange yellow powder;
b. starts to decompose at about 150° C. but, even at 300° C., does not melt;
c. has a molecular weight of about 1240;
d. has the following elemental analysis: C, 58.92, H, 7.58; N, 2.29;
e. is soluble in pyridine, dimethylformamide and dimethylacetamide, less soluble in 60% methanol, concentrated ethanol and isopropanol and is insoluble in benzene, acetone, water, chloroform, absolute ethanol, cyclohexane, ethyl acetate and diethyl ether;
f. gives an intense blue coloration in sulfuric acid;
g. has the following infrared absorption spectrum in a KBr pellet (in cm^{-1}):

3400 (S)	1465 (W)	1075 (S)
3100 (W)	1390 (W)	1045 (W)
2930 (S)	1350 (W)	1010 (S)
2860 (M)	1325 (W)	995 (W)
1715 (M)	1295 (W)	940 (W)
1650 (M)	1250 (W)	890 (W)
1600 (S)	1185 (S)	850 (M)
1575 (W)	1140 (W)	835 (W)
1545 (W)	1110 (M)	800 (W)

wherein S means strong absorption, M medium absorption and W weak absorption;
h. has the following ultraviolet absorption spectrum taken at a concentration of 1 mg. per 100 ml. of dimethylformamide;

344 mμ ($\epsilon = 3.5 \times 10^4$)

364 mμ ($\epsilon = 5.52 \times 10^4$)

384 mμ ($\epsilon = 8.04 \times 10^4$)

408 mμ ($\epsilon = 6.6 \times 10^4$)

i. has an optical rotation $[\alpha]_D^{25°C} = 187°$ to 194° (C = 0.3% in dimethylformamide at 25° C); and
j. is an aromatic heptaene giving by retroaldolization reaction p-N-methylamino-acetophenone and which contains mycosamine as a substituent and which has no titratable carboxyl group.

4. A process for making the antifungal and antiprotozoal antibiotic defined in claim 1, which comprises cultivating *Streptomyces diastatochromogenes* var. Krains CBS 101.74, in an aqueous nutrient medium under submerged aerobic conditions until substantial antifungal and antiprotozoal antibiotic activity is imparted to said medium by the production of lucknomycin.

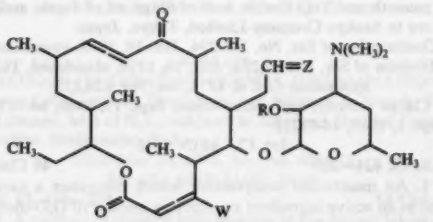
4,056,616

ROSAMICIN DERIVATIVES AND METHOD OF USING SAME

Hans Reimann, Wayne; Robert S. Jaret, Livingston, and Mohammad Mehdi Nafissi-Varchei, North Caldwell, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Mar. 5, 1976, Ser. No. 664,204
Int. Cl.[2] A61K *31/71;* C07H *17/08*
U.S. Cl. 424—180 51 Claims

47. A method of eliciting an antibacterial response which comprises administering to a warm-blooded animal having a bacterial infection a therapeutically effective quantity of a compound of the formulae:



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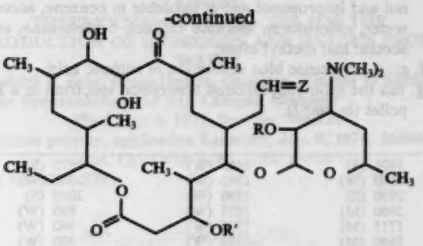
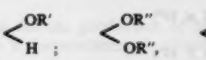


the non-toxic pharmaceutically acceptable acid addition salts thereof wherein the dotted lines represent facultative double bonds; Q is a member selected from the group consisting of O, and

Z is a member selected from the group consisting of O,



NOR′ and NOR″; R and R′ are members selected from the group consisting of hydrogen and hydrocarbon carbonyl having 2 to 18 carbon atoms; R″ is hydrogen or alkyl having 1 to 5 carbon atoms; B together wtih the carbon atoms of positions 12 and 13 to which it is attached represents a single bond or a double bond or, when Q or Z is other than O, or when the macrolide ring is saturated between positions 10 and 11 or unsaturated between positions 2 and 3, B may also be an oxirane ring; and W is a member selected from the group consisting of OR′ and hydrogen, R′ being as previously defined with the proviso that when W is hydrogen, positions 2 and 3 are connected by a double bond, and the further proviso that in formula II, when B, together with the carbon atoms which it is attached represents a double bond, W is OR′, Q is O, and positions 10 and 11 are connected by a double bond, Z is other than

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4,056,617

ORGANIC PYRIDAZYL PHOSPHOROTHIOATES AND THEIR USE AS INSECTICIDES

Teruomi Jojima; Hideakira Tsuji, both of Tokyo; Shinjiro Yamamoto, and Teiji Omino, both of Shiga, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 540,234, Jan. 10, 1975, abandoned, Division of Ser. No. 67,292, Aug. 26, 1970, abandoned. This application Oct. 6, 1975, Ser. No. 620,227

Claims priority, application Japan, Sept. 17, 1969, 44-73788; Sept. 1, 1969, 44-69218

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—200 **48 Claims**

1. An insecticidal composition which comprises a carrier and as an active ingredient an effective amount of O,O-diethyl O-(6-n-propoxy-3-pyridazyl)phosphorothioate.

4,056,618

NOVEL DIURETIC AND ANTIHYPERTENSIVE COMPOSITION

Olivier Mantel, Montmorency, France, assignor to Roussel-Uclaf, Paris, France

Filed Apr. 8, 1976, Ser. No. 674,755

Claims priority, application France, Apr. 11, 1975, 75.11377

Int. Cl.[2] A61K *31/535, 31/505*

U.S. Cl. 424—246 **7 Claims**

1. A diuretic and antihypertensive composition comprising an antihypertensively and diuretically effective amount of triamterene and cyclothiazide in a weight ratio of 10 to 200 parts of triamterene to one part of cyclothiazide with the optional presence of an inert pharmaceutical carrier.

4,056,619

1-SUBSTITUTED-2-(2-PYRIDINYL)ETHANONE N-OXIDES

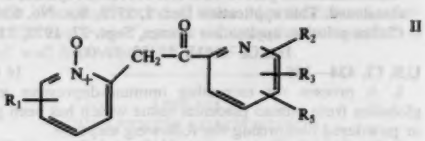
David T. Connor, Parsippany; Patricia A. Young, Madison, and Maximilian von Strandtmann, Rockaway Township, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sept. 8, 1975, Ser. No. 611,282

Int. Cl.[2] C07D *213/89;* **A61K** *31/44*

U.S. Cl. 424—263 **24 Claims**

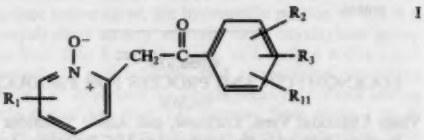
1. A compound of the formula II:



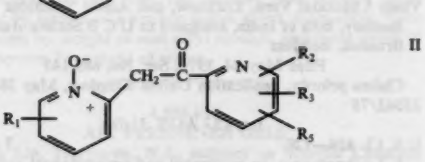
II

wherein R_1 is hydrogen or lower alkyl; R_2 and R_3 are each hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy or benzyloxy; and R_5 is hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy or benzyloxy; and the pharmaceutically acceptable acid addition salts thereof.

22. A method for treating hyperacidity in mammals in need of such treatment which comprises the administration of an effective amount of the compound of the formula I or II:



I



II

wherein R_1 is hydrogen or lower alkyl; R_2 and R_3 are each hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy or benzyloxy; R_{11} is hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy, benzyloxy, ortho-amino, ortho-lower alkylamino, ortho-alkanoylamino or ortho-benzoylamino; and R_5 is hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy, benzyloxy, and the pharmaceutically acceptable acid addition salts thereof.

4,056,620

SULPHOXIDES

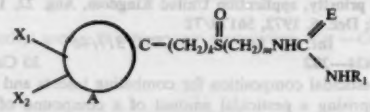
George Raymond White, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 627,418, Oct. 30, 1975, Pat. No. 3,979,398, which is a division of Ser. No. 436,285, Jan. 24, 1974, Pat. No. 3,932,443. This application May 24, 1976, Ser. No. 689,013

Int. Cl.[2] C07D *277/26, 263/32;* A61K *31/42, 31/425*

U.S. Cl. 424—270 10 Claims

1. A compound of the formula:



wherein A is such that the heterocyclic nucleus formed is a thiazole or oxazole ring; X_1 and X_2, which may be the same or different are hydrogen, lower alkyl, trifluoromethyl, halogen or amino *k* is 0 to 2 and *m* is 2 or 3 provided that the sum of *k* and *m* is 3 or 4; E is oxygen, sulphur or NH_2; R_1 is hydrogen, lower alkyl, benzoyl or dimethylaminoethyl; and R_2 is hydrogen, nitro, cyano, alkanesulphonyl having 1 to 3 carbon atoms, benzenesulphonyl, halobenzenesulphonyl or toluenesulphonyl.

10. A pharmaceutical composition to inhibit histamine H-2 receptors comprising in an amount effective to inhibit said receptors a compound of claim 1 together with a pharmaceutically acceptable diluent or carrier.

4,056,621

IMIDAZOLYLMETHYLTHIOETHYL DITHIOCARBAMATE COMPOUNDS

Thomas Henry Brown; Graham John Durant; Charon Robin Ganellin, all of Welwyn Garden City, and Robert John Ife, Stevenage, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

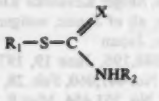
Filed Jan. 27, 1976, Ser. No. 652,925

Claims priority, application United Kingdom, Feb. 3, 1975, 4538/75

Int. Cl.[2] A61K *31/415;* C07D *233/64*

U.S. Cl. 424—273 R 7 Claims

1. A compound of the formula:



wherein R_1 represents a grouping of the structure

Het — $CH_2S(CH_2)_2$—

wherein Het is an imidazole, ring, which ring is optionally substituted by lower alkoxy or halogen R_2 is hydrogen, lower alkyl or the same as R_1; X is sulphur or a hydrate or pharmaceutically acceptable acid addition salt or hydrated salt thereof.

7. A method of blocking histamine H_2-receptors which comprises administering to an animal in an effective amount to block said receptors a compound of claim 1.

4,056,622

N-SULFONYL-N-DIHALOPHENYLIMIDAZOLIDINEDIONES

Chiyozo Takayama, Osaka; Yoshio Hisada, Kawanishi; Toshiro Kato, Osaka, and Akira Fujinami, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

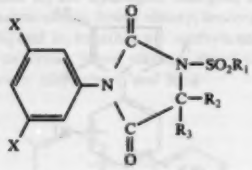
Filed Apr. 15, 1976, Ser. No. 677,440

Claims priority, application Japan, Apr. 22, 1975, 50-49250

Int. Cl.[2] C07D *233/86;* A61K *31/415*

U.S. Cl. 424—273 R 16 Claims

1. A compound of the formula:



wherein X is a halogen atom, R_1 is a C_1–C_{12} alkyl group, a C_2–C_4 alkenyl group or a halogenated C_1–C_4 alkyl group having 1 to 3 halogen atoms, and R_2 and R_3 are individually a hydrogen atom or a methyl group.

15. A method for controlling fungi which comprises applying a fungicidally effective amount of a compound according to claim 1 to the fungi.

4,056,623

METHODS OF TREATING ANIMALS SUFFERING FROM HYPERLIPIDEMIA USING CERTAIN N-PHENYL SULPHONYL-N'-(3-AZABICYCLOALKYL) UREAS

Jacques Duhault, Chatou, France, assignor to Science Union et Cie, Societe Francaise de Recherche Medicale, Suresnes, France

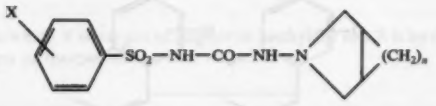
Continuation-in-part of Ser. No. 555,427, March 5, 1975, abandoned. This application June 3, 1976, Ser. No. 692,387

Int. Cl.[2] A61K *31/40, 31/445*

U.S. Cl. 424—274 5 Claims

1. A method of treating a warm-blooded animal suffering from hyperlipidemia to effect improvement in such condition and thereby reduce the risk of arteriosclerosis, which consists of administering to such animal an effective anti-lipid infiltration and deposition amount of a compound selected from the group consisting of:

A. an N-benzenesulphonyl-N'-(3-azabicycloalkyl) urea of the formula:



wherein: X is a substituent selected from the group consisting of chloro, bromo, fluoro, and a lower-alkyl radical of 1 to 5 carbon atoms, inclusive; and *n* is 1 to 3, inclusive; and

B. a physiologically tolerable addition salt thereof.

4,056,624

METHOD OF TREATING DERMAL INFLAMMATION

Howard B. Lassman, Flemington, and William J. Novick, Jr., Lebanon, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

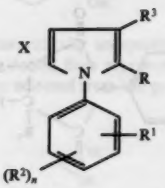
Filed May 14, 1976, Ser. No. 686,525

Int. Cl.[2] A61K *31/40, 31/66*

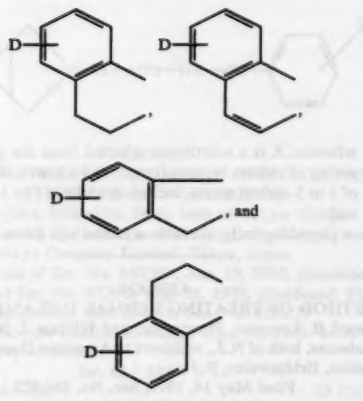
U.S. Cl. 424—274 14 Claims

1. A method of treating inflammation in the dermal layers of

mammals which comprises topically administering to the inflamed area of a patient an effective amount of a pyrrole of the formula



wherein R is alkyl of from 1 to 6 carbon atoms, thienyl, phenyl, diphenyl or phenyl substituted by halogen, trifluoromethyl, alkyl of from 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, nitro, cyano or hydroxy; R^1 is carboxy, alkoxycarbonyl of from 2 to 7 carbon atoms, carbamoyl, N-alkylcarbamoyl of from 2 to 7 carbon atoms, N,N-dialkylcarbamoyl of from 3 to 7 carbon atoms, hydroxycarbamoyl or dialkylphosphinylalkoxycarbonyl of from 4 to 10 carbon atoms; R^2 is hydrogen, hydroxyl, mercapto, halogen, trifluoromethyl, alkoxy of from 1 to 6 carbon atoms, alkanoyloxy of from 1 to 6 carbon atoms, amino, alkanoylamino of from 1 to 6 carbon atoms, dialkylthiocarbamoyloxy of from 3 to 7 carbon atoms or dialkylcarbamoylthio of 3 to 7 carbon atoms; R^3 is hydrogen, alkanoyl of from 1 to 6 carbon atoms or phenyl; X is alkylene of from 3 to 5 carbon atoms, alkylene of from 3 to 5 carbon atoms substituted by alkyl or alkoxy of from 1 to 6 carbon atoms, divinylene, divinylene substituted by alkyl of from 1 to 6 carbon atoms or



wherein D is hydrogen, alkoxy of from 1 to 6 carbon atoms or halogen; and *n* is the integer 1 or 2.

4,056,625

PESTICIDAL COMPOSITIONS CONTAINING BENZODIOXOLE DERIVATIVES AND METHODS OF COMBATING PESTS

Peter Stuart Gates, Cambridge, and John Gillon, Linton, both of England, assignors to Fisons Limited, London, England

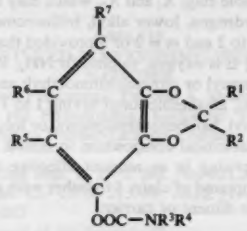
Division of Ser. No. 389,202, Aug. 17, 1973, Pat. No. 3,948,952, which is a continuation-in-part of Ser. No. 347,462, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 130,487, April 1, 1971, Pat. No. 3,736,338, which is a continuation-in-part of Ser. No. 706,628, Feb. 19, 1968, abandoned. This application Dec. 18, 1975, Ser. No. 641,925

Claims priority, application United Kingdom, Aug. 22, 1972, 39001/72; Dec. 6, 1972, 56170/72

Int. Cl.[2] A01N *9/28*; C07D *317/46*

U.S. Cl. 424—282 **33 Claims**

1. A pesticidal composition for combating insects and acarids comprising a pesticidal amount of a compound of the formula



wherein

R^1 and R^2 are selected from the group consisting of hydrogen and alkyl of 1 to 6 carbon atoms and a group where R^1 and R^2 together with the linking carbon atom form a cycloaliphatic ring selected from the group consisting of cycloalkane and cycloalkene rings of 5 to 7 carbon atoms;

R^3 is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and lower alkanoyl;

R^4 is selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of up to 4 carbon atoms and alkynyl of up to 4 carbon atoms; and

one of R^5, R^6 and R^7 are selected from the group consisting of hydrogen, halogen and alkyl of 1 to 4 carbon atoms, and wherein the remaining members of R^5, R^6 and R^7 each represent hydrogen in combination with at least one material selected from the group consisting of carriers, wetting agents, and mixtures thereof.

4,056,626

PHARMACEUTICAL COMPOSITION CONTAINING BENZOFURAN DERIVATIVE

Kiyoshi Ito, Otsu; Masahiko Ikemoto, Shiga; Kazuhiko Kimura, Otsu, and Teruo Nakanishi, Kyoto, all of Japan, assignors to Kakenyaku Kako Co., Ltd., Tokyo, Japan

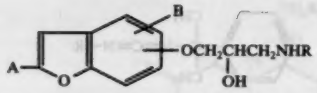
Continuation-in-part of Ser. No. 588,195, June 19, 1975, abandoned, which is a division of Ser. No. 447,060, Feb. 28, 1974, abandoned, which is a division of Ser. No. 251,454, May 8, 1972, Pat. No. 3,853,923. This application Feb. 27, 1976, Ser. No. 662,099

Claims priority, application Japan, May 13, 1971, 46-32145; July 14, 1971, 46-52333; Oct. 28, 1971, 46-86109; Jan. 6, 1972, 47-4395

Int. Cl.[2] A61K *31/34*

U.S. Cl. 424—285 **23 Claims**

1. A pharmaceutical composition possessing a β-adrenergic blocking activity and local anesthetic activiy which comprises as the essential active ingredient an effective amount a benzofuran derivative of the formula:



(I)

wherein A is —COR',

or ethyl group; B is hydrogen atom when A is —COR' or

or —COR" substituted at the 3 or 4 position of the benzofuran nucleus when A is ethyl; R is an alkyl group having 1 to 5 carbon atoms; R' is an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 3 carbon atoms or phenyl group; R" is an alkyl group having 1 to 4 carbon atoms, phenyl or phenylalkyl group wherein the alkyl moiety has 1 to 2 carbon atoms; and the substituted propoxy group is at the 3, 4, 5, 6 or 7 position of the benzofuran nucleus; or a pharmacetuically acceptable acid addition salt thereof in admixture with a pharmaceutically acceptable carrier.

4,056,627

BIS-CYCLOALKYLTHIOCARBAMATES AS INSECT CONTROL AGENTS

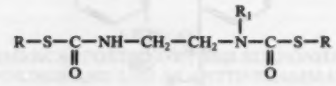
Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 574,472, May 5, 1975, Pat. No. 3,960,917. This application Mar. 10, 1976, Ser. No. 666,296

Int. Cl.[2] A01N *9/12, 9/20*

U.S. Cl. 424—300 **6 Claims**

1. A method for selectively impeding the metamorphosis of insects comprising applying to the insect at its larval stage, a metamorphosis-inhibiting effective amount of a compound having the formula



wherein R is cycloalkyl having from 3 to 7 carbon atoms, and R_1 is lower alkyl.

4,056,628

INSECTICIDAL ESTERS OF ALPHA-PHENOXY ALKANOIC ACIDS WITH SUBSTITUTED BENZYL ALCOHOLS

Pavol Winternitz, Greifensee, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

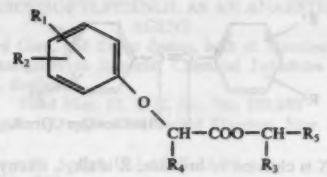
Filed Aug. 3, 1976, Ser. No. 711,330

Claims priority, application Switzerland, Aug. 8, 1975, 10380/75; June 28, 1976, 8230/76

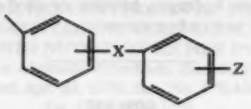
Int. Cl.[2] A01N *9/24; C07C 69/76*

U.S. Cl. 424—308 **13 Claims**

1. A substituted α-aryloxycarboxylic acid ester of the formula

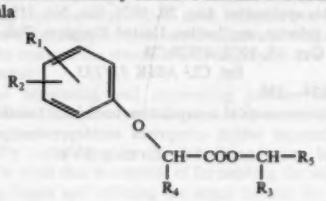


wherein R_1 and R_2 are hydrogen, halogen, alkyl containing from 1 to 3 carbon atoms, lower alkoxy, lower alkylthio, cyano or nitro; or R_2 and R_1 together are methylenedioxy; R_3 is hydrogen atom or cyano, lower alkenyl, lower alkynyl or lower alkyl; R_4 is lower alkyl group and R_5 is

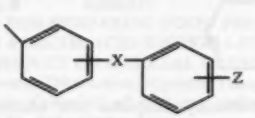


in which X is oxygen or sulphur or methylene and Z is hydrogen or fluorine.

11. An insecticidal composition comprising as an essential ingredient an insecticidally effective amount of a compound of the formula



wherein R_1 and R_2 are hydrogen, halogen, alkyl containing from 1 to 3 carbon atoms, lower alkoxy, lower alkylthio, cyano or nitro; or R_1 and R_2 together are methylenedioxy; R_3 is hydrogen atom or cyano, lower alkenyl, lower alkynyl or lower alkyl; R_4 is lower alkyl group and R_5 is



in which X is oxygen or sulphur or methylene and Z is hydrogen or fluorine and an inert carrier.

4,056,629

PHARMACOLOGICALLY ACTIVE O-ACYL-2,3-DIARYL-3-HALOGENO-ACRYL-ALDOXIMES

Wilhelm Bartmann, Neuenhain, Taunus; Gerhard Beck, Frankfurt am Main; Ernold Granzer, Kelkheim, Taunus; Josef Musil, Konigstein, Taunus, and Hermann Teufel, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

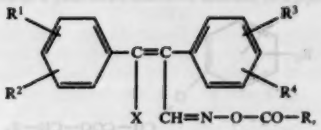
Filed Aug. 20, 1976, Ser. No. 716,277

Claims priority, application Germany, Aug. 22, 1975, 2537372

Int. Cl.[2] A61K *31/15*

U.S. Cl. 424—327 **1 Claim**

1. A method for treating hyperurecemia which comprises orally administering to a patient suffering therefrom a therapeutically effective amount of a compound of the formula



wherein X is chlorine or bromine; R is alkyl, alkenyl, alkoxy, alkenoxy, or alkylamino each having from 1 to 12 carbon atoms, or R is a member selected from the group consisting of phenyl, phenyloxy, phenylalkyl, phenylalkoxy, phenylamino, phenylalkylamino, naphthyl, naphthyloxy, naphthylalkyl, naphthylalkoxy, naphthylamino, and naphthylalkylamino, or R is such a member mono-substituted or di-substituted by alkyl having 1 to 6 carbon atoms; and R^1, R^2, R^3, and R^4 are the same or different and are hydrogen, halogen, or alkyl or alkoxy each having from 1 to 6 carbon atoms.

4,056,630

DIPHENYLPROPYLAMINES FOR TREATING DEPRESSION

Judith Ann Clark, Barrington, England, assignor to Beecham Group Limited, England

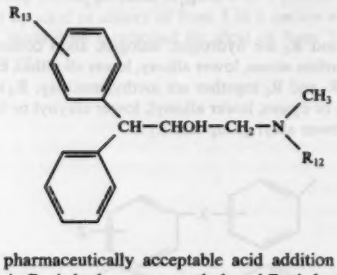
Division of Ser. No. 443,021, Feb. 15, 1974, Pat. No. 4,028,415. This application Aug. 30, 1976, Ser. No. 718,411

Claims priority, application United Kingdom, Feb. 24, 1973, 9183/73; Oct. 13, 1973, 47928/73

Int. Cl.[2] A61K *31/135*

U.S. Cl. 424—330 **26 Claims**

1. A pharmaceutical composition useful for treating depression in humans which comprises antidepressantly effective amount of a compound of the formula (IV):



or a pharmaceutically acceptable acid addition salt thereof wherein R_{12} is hydrogen or methyl; and R_{13} is hydrogen, fluorine, chlorine, bromine or trifluoromethyl, in combination with a pharmaceutically acceptable carrier.

4,056,631

METHOD OF COMBATTING TICKS

Shigeo Kitaoka, Musashino; Katsuhiro Johkoh, Yokohama; Hisashi Ebisawa; Tadashi Sato, both of Tokyo; Hiroshi Kubo; Sosuke Takahashi, both of Yokohama, and Yoshinobu Kawase, Tokyo, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

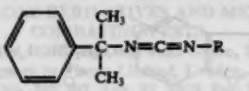
Continuation-in-part of Ser. No. 515,929, Oct. 18, 1974, Pat. No. 3,995,053. This application June 8, 1976, Ser. No. 693,833

Claims priority, application Japan, Oct. 23, 1973, 48-118458

Int. Cl.[2] A01N *9/06, 9/20, 9/24*

U.S. Cl. 424—330 **17 Claims**

1. A method of combatting ticks which comprises applying to the surface of the body of domestic animals infested with ticks a pesticidally effective amount of a carbodiimide of the formula



wherein R is a moiety selected from the group consisting of (1) aryclic alkyl containing 2–18 carbon atoms; (2) cyclohexyl;; (3) cyclohexyl substituted by 1–3 methyl groups (4) phenyl; (5) phenyl substituted by at least one moiety selected from the group consisting of alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms and chlorine; (6) benzyl; (7) p-chlorobenzyl; and (8) phenylethyl.

4,056,632

2-HYDROXYMETHYL-2'-AMINOMETHYL-DIPHENYL-SULFIDES AND METHOD OF USE

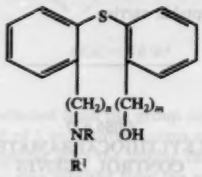
Nariman Bomanshaw Mehta, and Lawrence Edward Brieaddy, both of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 597,697, July 21, 1975, Pat. No. 3,997,540. This application Aug. 20, 1976, Ser. No. 716,163

Int. Cl.[2] A01N *9/20, 9/24*

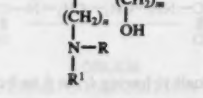
U.S. Cl. 424—330 **61 Claims**

1. A compound of the formula



or an acid addition salt thereof where R and R^1 are the same or different and are each hydrogen or lower alkyl, in the above lower alkyl has 1 to 4 carbon atoms and *n* and *m* are each 1.

31. The method of treating depression in a mammal which comprises administering to a depressed mammal an effective antidepressant amount of a compound of the formula



or a pharmaceutically acid addition salt thereof where R and R^1 are the same or different and are each hydrogen or lower alkyl, in the above lower alkyl has 1 to 4 carbon atoms and n and m are each 1.

4,056,633

D-HOMO-20-KETOPREGNANES AND METHOD FOR INDUCING ANESTHESIA OR NARCOSIS

Ulrich Kerb; Rudolf Wiechert; Helmut Wachtel; Otto Engelfried, and Klaus Kieslich, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

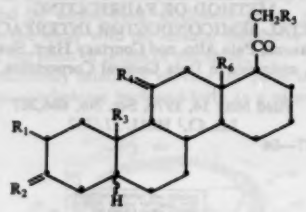
Filed Dec. 17, 1975, Ser. No. 641,602

Claims priority, application Germany, Dec. 23, 1974, 2461312; Feb. 14, 1975, 2506688

Int. Cl.[2] C01B *33/24;* **C07J** *63/00*

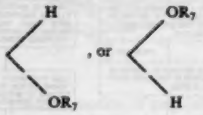
U.S. Cl. 424—331 **37 Claims**

1. A D-homo-20-ketopregnane of the formula



wherein R_1 is hydrogen, fluorine, chlorine, bromine, alkyl of 1–15 carbon atoms, alkoxy of 1–15 carbon atoms, or azido;

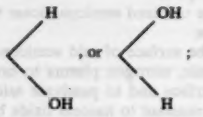
R_2 is oxygen



and R_7 is hydrogen, alkyl of 1–8 carbon atoms or alkanoyl of up to 5 carbon atoms;

R_3 is hydrogen or methyl;

R_4 is oxygen, two hydrogens,



R_5 is hydrogen, hydroxy, alkoxy of 1–15 carbon atoms or mercapto,

R_6 is methyl or ethyl;

the hydrogen atom in the 5-position is in the α-or β-configuration; and

pharmaceutically acceptable acid addition salts thereof.

36. A method for inducing anesthesia or narcosis in human and veterinary medicine comprising administering to a patient a narcotic-anesthetic unit dosage of a compound of claim **1**, in admixture with a pharmaceutically acceptable carrier.

4,056,634

DIMERCAPTOETHYL ETHER SULFONIUM COMPOUNDS AND USE AS ANTIINFLAMMATORY AND ANTIRHEUMATIC AGENTS

Davide Della-Bella, Milan, and Dario Chiarino, Monza, Milan, both of Italy, assignors to Whitefin Holding S.A., Lugano, Switzerland

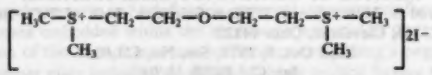
Filed Feb. 17, 1976, Ser. No. 658,756

Claims priority, application Italy, Feb. 19, 1975, 20419/75

Int. Cl.[2] C01B *33/12;* **C07C** *149/46*

U.S. Cl. 424—335 **1 Claim**

1. Pharmaceutical compositions having antiinflammatory and antirheumatic activity, containing a therapeutically effective amount of the compound of formula



in admixture with suitable binding agents, excipients, diluents as well as carriers therapeutically acceptable for human and veterinary use.

4,056,635

2,6-DIISOPROPYLPHENOL AS AN ANAESTHETIC AGENT

John Baird Glen, and Roger James, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 19, 1975, Ser. No. 559,880

Claims priority, application United Kingdom, Mar. 28, 1974, 13739/74

Int. Cl.[2] A61K *31/05*

U.S. Cl. 424—346 **2 Claims**

1. A method for producing anaesthesia in a warm-blooded animal which comprises administering parenterally to said animal an anaesthetically effective amount of 2,6-diisopropylphenol.

4,056,636

PROCESS FOR THE CONVERSION OF STARCH AND PROTEIN-CONTAINING CELLULOSIC WASTE PRODUCTS INTO NUTRIENTS RICHER IN PROTEINS

Hans Müller, Im Almendli, Erlenbach, Zurich, Switzerland

Filed Apr. 22, 1975, Ser. No. 570,456

Int. Cl.[2] C13K *1/06*

U.S. Cl. 426—48 **3 Claims**

1. A process for the recovery of high-protein materials from starch and protein-containing pieces and crumbs of broken baked goods from bakeries which process comprises

dispersing said baked goods in comminuted form in water;

subjecting said dispersion to an acid-, enzyme-, or microorganism-induced hydrolysis under suitable conditions sufficient to convert the starch in said dispersion to a fermentable sugar;

thereafter separating and recovering protein containing solids from the hydrolyzed dispersion by means of ultrafiltration, and

aerobically cultivating in the remaining sugar-containing liquid a yeast that is capable of fermenting the sugar-containing liquid and utilizing the sugar therein for growth, and

finally recovering from the fermented liquid a high protein yeast formed by said fermentation whereby said protein containing solids and said high protein yeast are suitable for use in human and animal food products.

4,056,637

PROCESS FOR PREPARING FOOD PRODUCTS CONTAINING A LACTIC ACID BACTERIA-FERMENTED PRODUCT OF A CEREAL GERM

Yoshihide Hagiwara, Takarazuka; Miyauchi Tetsuji, Itami, and Yuki Morimasa, Kawanishi, all of Japan, assignors to Japan Natural Food Co. Ltd., Osaka, Japan

Filed June 8, 1976, Ser. No. 693,761

Int. Cl.[2] A23L *1/172, 1/28*

U.S. Cl. 426—52 **12 Claims**

1. A process for preparing a lactic acid bacteria-fermented food product from a cereal germ, which comprises inoculating a culture medium containing a water extract of a cereal germ as a main ingredient with lactic acid bacteria, and then cultivating the lactic acid bacteria therein to produce the lactic acid bacteria-fermented product.

4,056,638

DIELECTRIC DRYING OF FUNGAL MATERIAL AND RESULTANT TEXTURED PRODUCT

Hua-Feng Huang, Mendenhall, Pa., and Richard Alan Yates, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 587,149, June 16, 1975, abandoned. This application May 6, 1976, Ser. No. 683,926

Int. Cl.[2] A23J *3/00, 1/18*

U.S. Cl. 426—244 **30 Claims**

1. A process comprising dewatering a fermenter effluent to

form a mycelial fungal mass which contains from 15 to 40 weight percent solids, dielectrically heating said mass for from 5 to 180 seconds during which period the solids content thereof is increased by from about 8 to about 40 weight percent as based on total dewatered composition whereby a product containing from 30 to 70 weight percent solids is produced.

4,056,639

PRESERVING RED COLOR IN FRESH RED MEATS

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Presto Products Incorporated, Appleton, Wis.

Filed July 9, 1976, Ser. No. 703,723
Int. Cl.[2] A23B *4/14;* A23L *1/272*
U.S. Cl. 426—264 17 Claims

1. A process for treating fresh red meat to preserve the red color of the meat comprising the step of introducing into the meat a meat color preservative selected from the group consisting of sodium cyanate, acetylurea, sodium-5-acetylhydantoate, urethylane sodium carboxylate, and mixtures thereof, in an amount sufficient to stabilize the red color of the meat.

4,056,640

METHOD AND APPARATUS FOR MAKING CONFECTIONERIES

Friedrich Otto, Hameln, Weser, Germany, assignor to A. Stephan U. Sohne GmbH & Co., Hameln, Weser, Germany

Filed Jan. 19, 1976, Ser. No. 650,235
Claims priority, application Germany, Jan. 18, 1975, 2501933
Int. Cl.[2] A23G *3/00*
U.S. Cl. 426—573 11 Claims

1. A method of making low boiled confectioneries comprising combining a plurality of first confectionery ingredients, heating said ingredients to an initial temperature of 60° C by directly admitting steam therein, subsequently adding a plurality of additional confectionery ingredients including milk to form a confectionery mass while continuously heating said mass to approximately 80° C by directly admitting steam, maintaining said mass at approximately 80° C for a maximum of about 45 seconds and subsequently heating said mass to a temperature of approximately 125° C by directly admitting steam to complete cooking of said mass, said confectionery being continuously mixed and emulsified by at least one rotary member at speeds between about 1500–3000 rpm throughout heating.

4,056,641

PROCESS AND APPARATUS FOR COATING FUEL FERTILE OR ABSORBER MATERIAL CONTAINING PARTICLES FOR HIGH TEMPERATURE FUEL ELEMENTS

Hans Huschka, and Wolfgang Warzawa, both of Grossauheim, Germany, assignors to HOBEG Hochtemperaturreaktor-Brennelement G.m.b.H., Grossauheim, Germany

Filed Aug. 23, 1974, Ser. No. 500,017
Claims priority, application Germany, Aug. 27, 1973, 2343123
Int. Cl.[2] G21C *3/06;* B05D *7/00*
U.S. Cl. 427—6 9 Claims

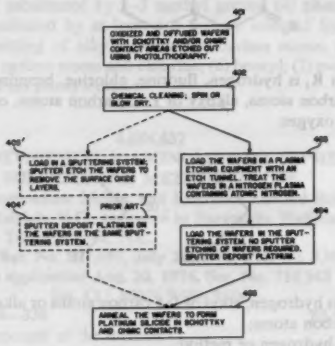
1. A process for coating particles of a member of the group consisting of uranium oxide, uranium carbide, thorium oxide, thorium carbide, plutonium oxide, plutonium carbide, boron carbide, boronated graphite, hafnium carbide, gadolinium oxide, samarium oxide and europium oxide particles for use in a high-temperature fuel element of a nuclear reactor in a fluidized bed comprising heating the particles and fluidizing the particles with preheated inert carrier gas blown upwardly through the particles and injecting coating gas at a higher velocity than the carrier gas above the fluidized bed and passing the coating gas downwardly in counter flow to the carrier gas through the fluidized-particle bed to deposit said coating gas by pyrolytic decomposition.

4,056,642

METHOD OF FABRICATING METAL-SEMICONDUCTOR INTERFACES

Arjun N. Saxena, Palo Alto, and Courtney Hart, San Jose, both of Calif., assignors to Data General Corporation, Westboro, Mass.

Filed May 14, 1976, Ser. No. 684,207
Int. Cl.[2] H01L *21/302*
U.S. Cl. 427—84 4 Claims


OXIDIZED AND DIFFUSED WAFERS WITH SCHOTTKY AND/OR OHMIC CONTACT AREAS ETCHED OUT USING PHOTOLITHOGRAPHY.
CHEMICAL CLEANING, SPIN OR BLOW DRY.
LOAD IN A SPUTTERING SYSTEM, SPUTTER ETCH THE WAFERS TO REMOVE THE SURFACE OXIDE LAYERS.
LOAD THE WAFERS IN A PLASMA ETCHING EQUIPMENT WITH AN ETCH TUNNEL, TREAT THE WAFERS IN A NITROGEN PLASMA CONTAINING ATOMIC NITROGEN.
PRIOR ART
SPUTTER DEPOSIT PLATINUM ON THE WAFERS IN THE SAME SPUTTERING SYSTEM.
LOAD THE WAFERS IN THE SPUTTERING SYSTEM. NO SPUTTER ETCHING OF WAFERS REQUIRED. SPUTTER DEPOSIT PLATINUM.
ANNEAL THE WAFERS TO FORM PLATINUM SILICIDE IN SCHOTTKY AND OHMIC CONTACTS.

1. A process for fabricating metal-semiconductor interface comprising the steps of:

a. producing an oxidized semiconductor wafer with photoresisted areas;

b. subjecting the surface of said semiconductor wafer to a neutral, atomic, nitrogen plasma to break nascent oxide from said surface and to passivate said surface to make said surface resistant to nascent oxide buildup; and

c. depositing said metal on said semiconductur wafer to obtain said metal-semiconductor interface.

4,056,643

METHOD FOR DECORATIVE COLORING OF GLASS

Makoto Kume, Ashiya, Japan, assignor to Nippon Sheet Glass Co., Ltd., Japan

Continuation of Ser. No. 529,104, Dec. 3, 1974, abandoned. This application May 17, 1976, Ser. No. 687,375
Claims priority, application Japan, Dec. 8, 1973, 48-139845; Feb. 20, 1974, 49-20848
Int. Cl.[2] B05D *3/02*
U.S. Cl. 427—226 7 Claims

1. A method for decorative coloring of glass having a granite-like decorative design, which comprises coating the surface of a glass article containing alkali metal oxides and sulfide sulfur with a composition comprising a copper compound and a vanadium compound capable of forming vanadium pentoxide by subsequent heat-treatment, the amount of said vanadium compound being such that vanadium pentoxide resulting from the heat-treatment of the vanadium compound forms a melt together with the copper compound on the surface of the glass article and the melt forms an assembly of droplets having irregular sizes, the weight ratio of the copper compound coated to vanadium compound coated being 0.3 to 1.5, and then heat-treating the coated article at a temperature of from about 580° C to about 1000° C and for a period of time sufficient to obtain the desired degree of coloration.

4,056,644

METHOD OF COATING ANNULAR SURFACES

Alfred S. Howard, and William Selesnick, both of P.O. Box 22226, Cleveland, Ohio 44122

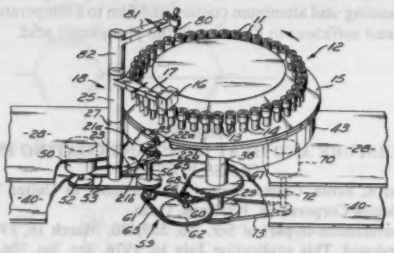
Filed Oct. 9, 1975, Ser. No. 621,006
Int. Cl.[2] B05B *13/04*
U.S. Cl. 427—284 15 Claims

1. A method of coating annular surfaces on a plurality of workpieces each having an annular surface, which comprises:

a. producing a relative translational component of motion

between an array of workpieces and a spray of a coating material by which each workpiece passes individually within the spray with the annular surface to be sprayed facing the point of origin of the spray;

b. simultaneously relatively moving the point of the spray and the workpieces back-and-forth in a plane generally



parallel to the plane of motion of step (a) and in synchronization with the motion of step (a) so that the path of the spray follows a portion of the curvature of each of the annular surfaces as the surface passes within the spray;

c. rotating the workpieces through at least one revolution while each workpiece is within the spray; and

d. spraying each workpiece with the coating material.

4,056,645

APERTURE REINFORCING MEANS FOR APERTURES IN REINFORCED FLEXIBLE MATERIALS

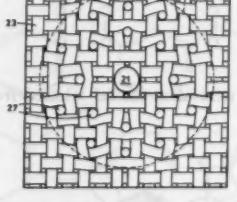
John Henry, Cowes, England, assignor to British Hovercraft Corporation Ltd., Yeovil, England

Filed July 12, 1976, Ser. No. 704,634

Claims priority, application United Kingdom, July 14, 1975, 29509/75

Int. Cl.² B32G *3/02, 3/10;* B60V *1/16*

U.S. Cl. 428—65 **8 Claims**



1. In a component manufactured from at least one layer of a reinforcing fabric material embedded within an elastomeric material and having at least one aperture extending through the elastomeric and reinforcing materials, aperture reinforcing means embedded within the elastomeric material at the location of the or each aperture, said means comprising a pegged washer plate including an apertured body portion having two opposed substantially parallel surfaces and a plurality of pegs spaced around the aperture in the body portion so as to extend outwardly from at least one of the opposed parallel surfaces to mesh with the reinforcing material.

4,056,646

FLOCKED FOAMED LATEX SHEET

Paul Marlin Westfall, St. Albans, and Howard Mayfield, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 16, 1975, Ser. No. 578,092

Int. Cl.² B32B *33/00*

U.S. Cl. 428—90 **4 Claims**

1. A soft, pliable, fiber reinforced, surface flocked, foamed latex sheet, said foamed latex sheet comprising a fibrous sheet or scrim base material weighing from 0.15 to 5 ounces per square yard, on at least one side of said base material a foamed latex, and on the exterior surface of said foamed latex a flock; wherein the foamed latex comprises from about 0.5 to about 8 ounces per square yard and the flock comprises from about 0.25 to 4 ounces per square yard.

4,056,647

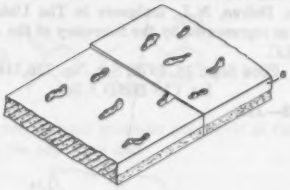
POWDER EDGE COATING FOR CEILING TILE

John R. Garrick, and Ray C. Kendig, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 29, 1975, Ser. No. 644,646

Int. Cl.² B32B *3/10, 3/02;* B05D *1/12*

U.S. Cl. 428—134 **4 Claims**



1. In a method of producing a ceiling board product comprising a body formed of a fibrous mass bound together by appropriate binder means, the front surface of the board having applied to it a decorative coating of a given color and the edge surfaces of said ceiling board having an open porous surface, the improvement consisting of applying to a portion of said edge surface of the ceiling board a coating consisting of a dry powder, said powder being applied in a quantity and color so as to render said edges basically the same color as the decorative color of the front face surface, said powder being adhered to the edges of the ceiling board only by mechanical entrapment of the powder in the pores of the edges of the ceiling board.

4,056,648

TRANSFERS

Anthony George Richardson, Belper, England, assignor to Denbyware Limited, England

Filed May 19, 1976, Ser. No. 688,089

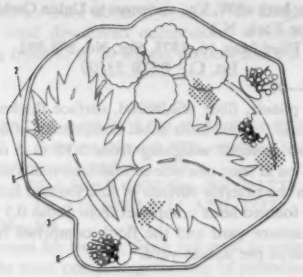
Claims priority, application United Kingdom, June 16, 1975, 25651/75; July 15, 1975, 29674/75

Int. Cl.² B05D *3/02;* B32B *3/10, 7/06, 17/08*

U.S. Cl. 428—138 **1 Claim**

1. In a transfer of the type to be applied to a substrate and subsequently fired to obtain permanent marking of the substrate, and comprising a base having a surface of soluble adhesive onto an area of which is printed a pattern of one or more glazes, colours or pigments, and consumable cover coat covering the pattern area, said transfer being removed from said base by use of a solvent to free it from said soluble adhesive, the improvement comprising: said cover coat is provided with a configuration of small aperatures over substantially the whole of the pattern area, the size of said apertures varying according to a half toning technique wherein smaller apertures are uti-

lized for fine pattern detail and vice versa, the cover coat being thus rendered porous but retaining its coherence to permit



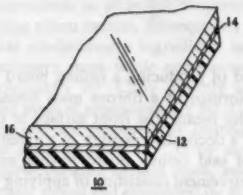
escape of solvent from behind the transfer without the necessity for squeegeeing.

4,056,649

ABRASION RESISTANT OPTICAL MATERIALS AND PROCESS FOR MAKING SAME

John J. Walls, Jr., Huntingdon Valley, Pa., and Richard A. McKyton, Delran, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 24, 1976, Ser. No. 726,714
Int. Cl.[2] B05D *5/06*
U.S. Cl. 428—215 **4 Claims**



1. Optical composite comprising
an allyl diglycol carbonate substrate, a chromium interlayer of about 50–200A in thickness bonded on said substrate, and a glass layer of about 3.25 μm to 4.5 μm in thickness, comprising substantially SiO_2, bonded on said chromium interlayer.

4,056,650

PROCESS FOR MAKING ALUMINUM-COATED GLASS-CERAMIC COOKING VESSEL AND ARTICLE PRODUCED THEREBY

Harold F. Dates, Corning; Joseph J. Domicone, Horseheads, and Joseph E. Nitsche, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 524,521, Nov. 18, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,479
Int. Cl.[2] B32B *15/04*
U.S. Cl. 428—332 **2 Claims**

1. A process for producing an aluminum-coated glass-ceramic cooking vessel exhibiting improved thermal durability which comprises the steps of:

a. selecting a glass-ceramic vessel composed of a lithium aluminosilicate glass-ceramic material comprising a principal crystal phase consisting of beta-spodumene solid solution;

b. preheating at least a selected surface portion of the glass-ceramic vessel to a temperature in the range of about 120°–600° C;

c. applying to the preheated selected surface portion a molten aluminum metal spray, said spray being produced by melting an aluminum metal powder and being applied in a quantity sufficient to provide an aluminum metal coating on the vessel having a thickness in the range of about 18–28 mils;

d. providing the aluminum coating with a film of phosphoric acid; and

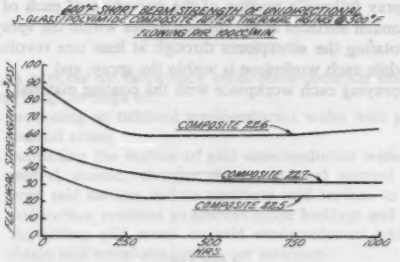
e. heating said aluminum coating and film to a temperature at least sufficient to decompose the phosphoric acid.

4,056,651

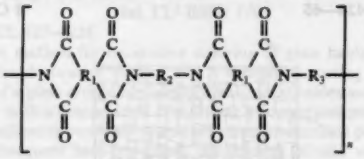
MOISTURE AND HEAT RESISTANT COATING FOR GLASS FIBERS

Daniel A. Scola, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

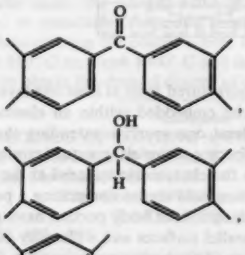
Continuation-in-part of Ser. No. 559,480, March 18, 1975, abandoned. This application July 16, 1976, Ser. No. 706,025
Int. Cl.[2] B32B *17/04, 27/26, 17/10*
U.S. Cl. 428—336 **6 Claims**


600°F SHORT BEAM STRENGTH OF UNIDIRECTIONAL S-GLASS/POLYIMIDE COMPOSITE AFTER THERMAL AGING @ 600°F FLOWING AIR 1000CC/MIN
FLEXURAL STRENGTH, KG/CM²
COMPOSITE #26
COMPOSITE #27
COMPOSITE #25
HRS

1. A moisture and heat resistant finish coating on materials having a hydroxylated surface consisting essentially of approximately, by weight, 40–98 percent of a polyimide film former selected from the group consisting of (1) a fully imidized and polymerized polyimide containing the repeating unit



wherein R_1 is a tetravalent radical selected from the group consisting of



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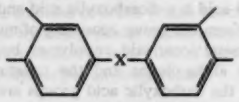
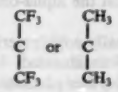
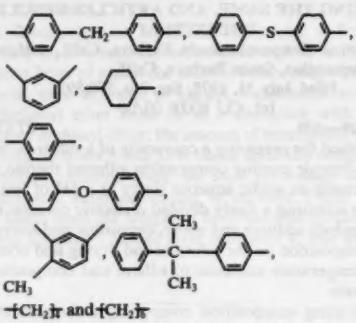


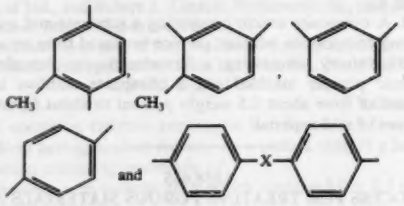
wherein X = O, S, SO_2, CH_2,



and R_2 is a divalent aromatic or aliphatic radical selected from the group consisting of

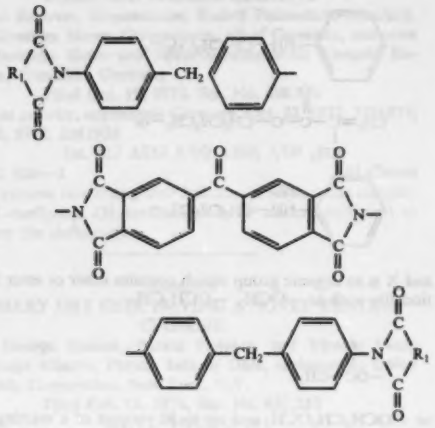


and R_3 is an aromatic divalent radical selected from the group consisting of

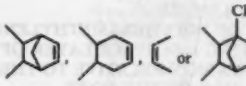


where X = CH_2, O, S or

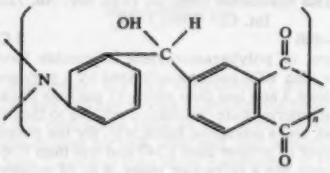
(2) an addition type resin intermediate derived from the low molecular weight polyimide monomer



wherein R_1 is an unsaturated divalent system such as



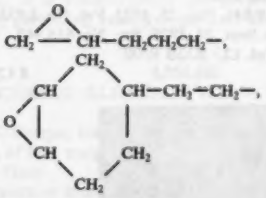
and (3) an hydroxylated aromatic polyimide in the amic acid stage having the repeating unit

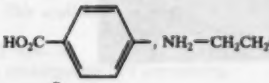


wherein *n* is an integer of sufficient magnitude, e.g., at least approximately 5, 2–60percent of a silane coupling agent characterized by the formula

$$R - Si - X_3$$

wherein R is an organic group containing amino, epoxy, aminehydrochloride or carboxy functionality such as





$NH_2-C(=O)-NH-CH_2CH_2CH_2-$,
$NH_2CH_2CH_2-NHCH_2CH_2CH_2-$,
$CH_2=CH-$, $HSCH_2CH_2CH_2-$,

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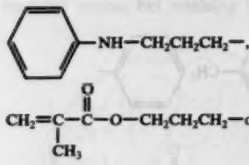
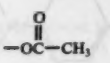


and X is an organic group which contains ether or ester functionality such as $-OCH_3$, $-OCH_2CH_3$,



or $-OCH_2CH_2OCH_3$ and up to 30 percent of a wetting and lubricating agent, said finish coating having a thickness of approximately 0.02–25 microns.

4,056,652

MONOFILAMENT OF POLYHEXAMETHYLENE ADIPAMIDE HAVING A SURFACE LAYER OF REDUCED ORIENTATION RELATIVE TO THE ORIENTATION OF THE CORE

Sibbley Paul Gauntt, Bon Air, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 641,135, Dec. 15, 1975, Pat. No. 4,009,511, which is a continuation of Ser. No. 480,759, June 19, 1974, abandoned. This application Sept. 13, 1976, Ser. No. 722,512

Int. Cl.[2] D02G *3/00*

U.S. Cl. 428—400 **3 Claims**

1. A filament of polyhexamethylene adipamide having a denier greater than 1000 and characterized by a polymer surface layer at least 3 and less than about 15 microns thick, said layer having an intermediate orientation relative to the orientation of the core and a refractive index, $n\|$, for the polymer in said surface layer of greater than 1.547 and less than 1.567 and the core polymer has a refractive index, $n\|$, of greater than 1.57.

4,056,653

SPHERICAL-SHAPED PARTICLES FROM IONOMER RESINS AND ETHYLENE/CARBOXYLIC ACID COPOLYMER RESINS

John Charles Gebhard, Jr., West Chester, Pa.; Marion Glen Waggoner, Hockessin, Del., and James Lang Webster, Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 419,894, Nov. 28, 1973, Pat. No. 3,933,954. This application Sept. 24, 1975, Ser. No. 616,443

Int. Cl.[2] B32B *9/00*

U.S. Cl. 428—402 **8 Claims**

1. Spherical-shaped particles having an average diameter of 10 to 100 microns, of a copolymer of (a) alpha-olefins of the formula $R—CH=CH_2$, where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, and (b) an alpha, beta-ethylenically unsaturated carboxylic acids having from 3 to 8 carbon atoms, said copolymer having from 0 to 90% of the carboxylic acid groups ionized by neutralization with metal ions, said metal ions having an ionized valence of from 1 to 3 inclusive when the unsaturated acid is a monocarboxylic acid and an ionized valence of one when the unsaturated acid is a dicarboxylic acid and said metal ions being selected from the group consisting of uncomplexed and complexed metal ions, said copolymer being a direct copolymer of the alpha-olefins and the unsaturated carboxylic acid in which the carboxylic acid groups are randomly distributed over all molecules and in which

1 the alpha-olefin content of the copolymer is at least 50 mol percent, based on the alpha-olefinacid copolymer,

2. the unsaturated carboxylic acid content of the copolymer is from 0.2 to 25 mol percent, based on the alpha-olefin-acid copolymer, and

3. any other monomer component optionally copolymerized in said copolymer is monothylenically unsaturated,

characterized in that the surfaces of the polymer particles are rough and convered with hemispherical-shaped bumps about 0.1 micron in diameter.

4,056,654

COATING COMPOSITIONS, PROCESSES FOR DEPOSITING THE SAME, AND ARTICLES RESULTING THEREFROM

Harry Wilfred Kompanek, Santa Barbara, Calif., assignor to KKF Corporation, Santa Barbara, Calif.

Filed July 24, 1975, Ser. No. 598,892

Int. Cl.[2] B32B *00/00*

U.S. Cl. 428—409 **37 Claims**

1. A method for preparing a composite of a substrate with a dielectric ceramic coating composition adhered thereto comprising forming an acidic aqueous slurry at a pH of less than about 1 by admixing a finely divided dielectric ceramic material, a phosphate additive and water, depositing said slurry as a coating composition on the substrate and drying said composition at a temperature sufficient to adhere said composition to said substrate.

15. A coating composition comprising a ferroelectric or piezoelectric ceramic material which is selected from the group consisting of barium titanate materials, lead zirconate-titanate materials, and lead metaniobate materials, and a phosphate additive admixed therewith in an amount of from about 0.5 weight percent to about 60 weight percent wherein the composition is an acidic aqueous slurry at a pH of less than about 1.

26. A composite article comprising a substrate and a dried coating composition adhered thereon prepared from an acidic aqueous slurry comprising a ferroelectric or piezoelectric ceramic powder material and a phosphate additive in an amount of from about 0.5 weight percent to about 60 weight percent of said material.

4,056,655

PROCESS FOR TREATING POROUS MATERIALS AND PRODUCTS OBTAINED

Marc Della Faille, Floree; Pierre Delvaux; Pierre Godard, both of Brussels, and Jean Pierre Mercier, Kessel-Lo, all of Belgium, assignors to S. A. Eternit, Kapelle op den Bos, Belgium

Continuation of Ser. No. 429,661, Dec. 28, 1973, abandoned. This application Feb. 3, 1976, Ser. No. 654,974

Claims priority, application France, Jan. 2, 1973, 73.00003

Int. Cl.[2] B32B *19/02*; B05D *3/02*

U.S. Cl. 428—443 **16 Claims**

1. A method for processing porous materials comprising in successive order the steps of: impregnating, with at least one water-insoluble polymerizable compound, a porous material

consisting essentially of a hydraulic binder and a filler selected from the group consisting of granular and fibrous fillers; fully covering the thus impregnated material with an aqueous solution of a salt which does not substantially modify the inherent viscosity of water and heating said impregnated material to a polymerization temperature for said compound and maintaining said temperature to polymerize said compound in said material while covered with said solution, wherein said solution is a solution of a salt which precipitates when contacted with said hydraulic binder in said material, said solution having a concentration of at least 10% of the saturation concentration at the polymerization temperature.

4,056,656

FLAME-RESISTANT LAMINATES

Arnold Franz, Troisdorf-Spich, and Werner Stein, Troisdorf-Kriegsdorf, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 283,247, Aug. 23, 1972, Pat. No. 3,922,459. This application Apr. 28, 1975, Ser. No. 572,243

Claims priority, application Germany, Aug. 27, 1971, 2141890; May 26, 1972, 2225587

Int. Cl.² B32B *15/08, 27/42*

U.S. Cl. 428—460 13 Claims

1. A flame-retardant laminated comprising a first layer, which first layer comprises between 35 and 65% by weight continuous layer of paper, the balance comprising a mixture of a synthetic resin of cresol or phenol, a plasticizer and pentabromodiphenyl ether alone or in a admixture with another brominated diphenyl ether, the amount of brominated diphenyl ether being between 5 and 15% based upon the weight of the moisture-free synthetic resin, the total percentage of brominated diphenyl ether amounting to between 5 and 15% by weight based upon the weight of moisture-free synthetic resin and plasticizer, and a second layer laminated to said first layer.

4,056,657

ZINC-ALUMINUM EUTECTIC ALLOY COATED FERROUS STRIP

Harry P. Leckie, Schererville; William C. Sievert, Chesterton, both of Ind., and Robert A. Legault, Homewood, Ill., assignors to Inland Steel Company, Chicago, Ill.

Continuation-in-part of Ser. No. 596,427, July 16, 1975, abandoned. This application June 10, 1976, Ser. No. 694,773

Int. Cl.² B32B *15/18*

U.S. Cl. 428—659 4 Claims

1. A corrosion resistant continuous hot-dip coated ferrous metal strip having applied directly on a surface thereof a hot-dip coating consisting essentially of:

1. zinc-aluminum eutectic alloy which contains 5.0 ± 0.5 wt. % aluminum, and
2. at least one metallic additive effective for lowering the surface tension of the coating selected from the group of metals consisting of lead, antimony, and tin with the total amount of said mtallic additives present in said coating being a maximum of about 0.1 wt. %, with the balance essentially zinc;

and said coating being characterized by a bright, smooth surface which is free of both ripples and spangles which interfere with the paintability and weldability of the strip and said coated strip being formable and resistant to corrosion due to exposure to a marine-type environment.

4,056,658

FOOD AND FODDER ADDITIVE

Heidrun Bertram, Grossauheim; Rudolf Fahnestich, Mombris, and Joachim Hesse, Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed Oct. 19, 1973, Ser. No. 408,051

Claims priority, application Germany, Oct. 23, 1972, 2251877; Dec. 18, 1972, 2261926

Int. Cl.² A23J *3/00*; A23K *1/00*

U.S. Cl. 426—2 11 Claims

1. A protein containing feed deficient in methionine containing DL-methionyl-DL-methionine in an amount sufficient to eliminate the deficiency.

4,056,659

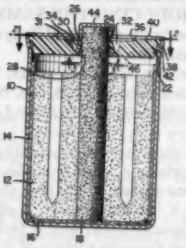
PRIMARY DRY CELL HAVING A NOVEL VENTING CLOSURE

Frank George Spanur, Parma Heights, and Vicente Santo Domingo Alberto, Parma, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,210

Int. Cl.² H01M *2/12*

U.S. Cl. 429—54 9 Claims



1. A magnesium dry cell comprising a metal anode cup having an open end and having a cathode mix therein, a central cathode rod protruding through said open end of said anode cup, and a closure for said open end, said closure including a central bore having at least three protrusions in contact with said cathode rod and adapted to be in interference fitting relationship when positioned on said central cathode rod, said central bore including a first section having a uniform and smooth surface which is slightly smaller in diameter than the diameter of said cathode rod and a second section extending downwardly from said first section and tapering outwardly away from said cathode rod and a venting sleeve defined by an annular groove in said closure and being disposed proximate said central bore, said venting sleeve being adapted to be urged outwardly away from said central cathode rod upon the development of a predetermined gas pressure within said cell thereby permitting venting of gas from the interior of said cell.

4,056,660

RECHARGEABLE CELL WITH OXYGEN SENSING ELECTRODE

Guy G. Rampel, Gainesville, and Jon R. Young, High Springs, both of Fla., assignors to General Electric Company, Columbus, Ohio

Continuation of Ser. No. 709,355, July 28, 1976, abandoned. This application Mar. 18, 1977, Ser. No. 778,898

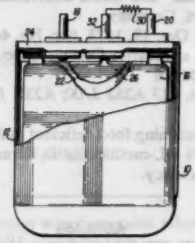
Int. Cl.² H01M *10/34*

U.S. Cl. 429—59 11 Claims

1. A rechargeable cell comprising:

a. a sealed casing;
b. a positive electrode within said casing;
c. a negative electrode within said casing and spaced from said positive electrode;

d. an alkaline aqueous electrolyte within said casing;
e. an oxygen sensing electrode within said casing; and
f. separators between adjacent electrodes;



g. said sensing electrode comprising a substrate having cadmium thereon, and silver dispersed in intimate contact with said cadmium.

4,056,661

ROLLED ADHESIVE SHEET HAVING PRINTABLE AND STRIPPABLE PROPERTIES AND PROCESS FOR PRODUCING THE SAME

Yo Sato, and Keisuke Enomoto, both of Tokyo, Japan, assignors to Kabushiki Kaisha Sato, Japan

Continuation of Ser. No. 528,565, Nov. 29, 1974, abandoned. This application July 15, 1976, Ser. No. 705,661

Int. Cl.[2] **B05D** *1/36, 5/02;* **B32B** *3/10, 5/16;* **C09J** *7/04*

U.S. Cl. 428—144 **10 Claims**

1. In an adhesive sheet having printability and strippability characteristics comprising a paper base sheet layer, a pigment layer provided on one surface of the base sheet layer comprising a pigment and a binder therefor, a silicone resin layer provided on the pigment layer, and a tacky adhesive layer provided on the other opposite surface of the base sheet layer, the improvement consisting in that the silicone resin layer exists in a fine discontinuous state with finely dispersed parts substantially without a silicone resin film whereby strippability thereof from the tacky adhesive layer after adhesively contacting the same is assured, and said parts substantially without a silicone resin film assure acceptance of printing inks by the sheet and printability thereof.

3. An adhesive sheet having printability and strippability characteristics comprising a paper base sheet layer, a pigment layer of a coarse surface texture provided on one surface of the base sheet layer comprising a pigment selected from the group consisting of cellulose powder, starch particles, phthalocyanine pigment, synthetic resin powders, clay, talc, titanium dioxide, terra alba, bentonite, calcium carbonate, barium sulfate, zinc oxide, silica, alumina, and mixtures thereof and a binder therefor selected from the group consisting of milk casein, oxidized starch, polyvinyl alcohol, polystyrene butadiene, polyacrylic esters, and ethylene-vinyl acetate copolymers employed in a quantity of from 5 to 25 percent by weight relative to the pigment; a silicone resin layer provided on the pigment layer, and a tacky adhesive layer provided on the other, opposite surface of the base sheet layer, said silicone resin layer existing in a fine discontinuous state with finely dispersed parts, said fine discontinuous state having been generated by coating silicone resin on the coarse surface of the pigment layer in a solution concentration of 1 to 25 percent by weight thereby enabling strippability to the sheet from the tacky adhesive layer after adhesively contacting the same, substantially without the presence of a silicone resin film to assure the printability of the sheet and acceptance thereof of printing inks.

6. In a process for producing an adhesive sheet having printability and strippability characteristics which comprises coating one surface of a paper base sheet layer with a pigment together with a binder thereby to form a pigment layer, coating the pigment layer with a silicone resin thereby to form a layer thereof, and coating the other opposite surface of the base sheet layer with a tacky adhesive thereby to form a layer thereof, the improvement consisting in that the silicone resin layer is formed in a fine discontinuous state with finely dispersed parts substantially without a silicone resin film whereby the strippability thereof from the tacky adhesive layer after adhesively contacting the same is assured, and said parts substantially without a silicone resin film assure acceptance of printing inks by the sheet and printability thereof.

4,056,662

THERMAL CELLS AND ELECTROLYTE COMPOSITION THEREFOR

Glenn F. Zellhoefer, Normal, Ill., assignor to National Union Electric Corporation, Stamford, Conn.

Filed Jan. 27, 1954, Ser. No. 406,542

Int. Cl.[2] **H01M** *6/36*

U.S. Cl. 429—112 **6 Claims**

PERCENTAGE COMPOSITION BY WEIGHT

POINT NO.	$CdCl_2$	NaCl	KCl
1	63.0	5.0	32.0
2	66.6	26.6	6.8
3	48.9	31.2	19.9
4	45.6	5.8	48.4
5	52.9	11.2	35.9
6	54.2	20.1	25.7
7	48.1	24.5	27.4
8	46.9	15.0	38.1

1. A fused electrolyte cell embodying an electrolyte consisting essentially of a mixture of 25 to 40 mole percent $CdCl_2$; 10 to 50 mole percent NaCl; and 10 to 65 mole percent KCl, containing proportions of each component substantially as detemined by a three system diagram thereof; and a depolarizing agent.

4,056,663

PERFORMANCE IN AN ORGANIC ELECTROLYTE

Carl Roger Schlaikjer, Arlington, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Nov. 3, 1975, Ser. No. 628,036

Int. Cl.[2] **H01M** *6/16*

U.S. Cl. 429—197 **7 Claims**

1. An electrochemical cell comprising an active metal anode, said active metal being above hydrogen in the EMF series; a salt of an active metal as electrolyte; an oxidizing cathode selected from the group consisting of V_2O_5, MoO_3, the chromates and dichromates of silver, mercury, copper, lead, iron, cobalt, nickel, thallium, bismuth and mixtures thereof; and an ether free electrolyte solvent system comprising a mixture of a polar material selected from the group consisting of propylene carbonate, ethylene carbonate and mixtures thereof with an adjuvant material selected from the group consisting of methyl acetate, ethyl acetate, propyl acetate, butyl acetate and mixtures thereof.

4,056,664

ELECTROCHEMICAL CELL HAVING AN AGO ELECTRODE DISCHARGING AT AN AG_2O VOLTAGE LEVEL

Sol Samson Jaffe, West Orange, N.J., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

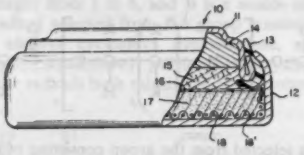
Filed Jan. 28, 1977, Ser. No. 763,375

Int. Cl.[2] **H01M** *10/34*

U.S. Cl. 429—217 **10 Claims**

1. An electrochemical cell comprising an anode, a cathode, a cathode current collector, and an electrolyte wherein said cathode comprises divalent silver oxide, a portion of said divalent silver oxide is attenuated in a direction parallel to the adjacent surfaces of said cathode and said cathode current collector, and the portion of said divalent silver oxide which is attenuated is positioned adjacent the surface of said cathode

current collector whereby an increase in internal cell resistance is introduced, and wherein the amount of divalent silver



oxide in the attenuated layer is 20 to 50 percent by volume and the balance is a non-conductive, non-reactive material.

4,056,665

COMPOSITION AND PROCESS

Lynn J. Taylor, Toledo, and John W. Tobias, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 301,199, Oct. 26, 1972, which is a continuation-in-part of Ser. No. 206,144, Dec. 8, 1971, Pat. No. 3,797,690. This application May 24, 1974, Ser. No. 472,947

Int. Cl.[2] C08J 3/20

U.S. Cl. 526—1 10 Claims

1. As a composition of matter, a photodegradable polymeric composition comprising at least one thermoplastic organic polymer and at least two aromatic carbonyl photosensitizers present in amounts sufficient to accelerate the photodegradation of the resulting polymeric composition, at least one aromatic carbonyl photosensitizer having an ultraviolet absorption maximum in the range of 280 to 330 millimicrons and at least one other aromatic carbonyl photosensitizer having an ultraviolet absorption maximum in the range of 330 to 400 millimicrons, each of said aromatic carbonyl photosensitizers being present at a level of about 0.01 to 2.0 percent by weight.

4,056,666

PROCESS FOR PRODUCING POLYION COMPLEX HAVING NUCLEIC ACID BASES

Toru Seita; Akihiko Shimizu, and Yujiro Kosaka, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed May 24, 1976, Ser. No. 689,062

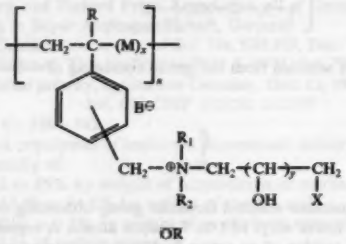
Claims priority, application Japan, June 2, 1975, 50-65426

Int. Cl.[2] C08F 8/42, 8/44

U.S. Cl. 526—29 5 Claims

1. A process for preparing a polyion complex which comprises reacting an alkali metal silicate with a nucleic acid base-containing polycation polymer having the unit formula:

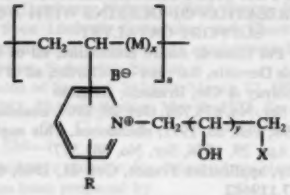
(I)



OR

-continued

(II)



wherein X represents adenine, thymine, cytosine, uracil or a derivative thereof, in which the purine nucleus is bonded at 9-position and the pyrimidine nucleus is bonded at 1-position; M represents a vinyl monomer; x is 0 or a positive integer; B represents a halogen atom or hydroxyl group; Y is 0 or 1; R represents a hydrogen atom or a C_{1-4} alkyl group; R_1 and R_2 respectively represent a C_{1-10} hydrocarbon group and n is an integer greater than 10.

4,056,667

PROCESS PERMITTING A POLYMERIZATION BATCH TO BE ADDITIONALLY COOLED

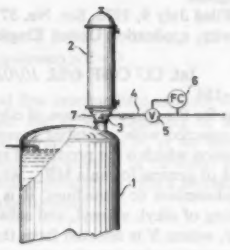
Helmut Sonnenberg, Erftstadt-Lechenich, and Bruno Krämer, Hurth, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 2, 1975, Ser. No. 636,934

Claims priority, application Germany, Dec. 7, 1974, 2458024

Int. Cl.[2] C08F 2/18, 14/06

U.S. Cl. 526—74 4 Claims



1. In a process permitting a vinyl chloride batch which is to undergo polymerization in suspension, with the use of an overall quantity of water necessary for effecting the polymerization to be additionally cooled, wherein gaseous matter formed in the gas chamber of a polmerization vessel is delivered through a pipe connection communicating with the gas chamber and a reflux condenser, to the reflux condenser and condensed therein, and the resulting condensate is returned to the polymerization vessel, the improvement which comprises spraying by means of at least one nozzle structure, a liquid consisting essentially of fully desalted water into the pipe connection substantially across its entire cross section and over the entire polymerization period, the water sprayed into the pipe connection having an approximate temperature of from 5° to 45° C and being used in a proportion ranging from about 10 to 15% by volume, based on overall quantity of water necessary for effecting the polymerization whereby the formation of undesirable polymer deposits in the condenser is prevented.

4,056,668

PROCESS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF OLEFINS WITH A SOLID SUPPORT CATALYST

Eugene Berger; Pol Gerard; Andre Delbouille, all of Brussels, and Jean-Louis Deroitte, Barvaux-sur-Ourthe, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 676,738, Oct. 20, 1967, abandoned, and Ser. No. 118,998, Feb. 25, 1971, abandoned. This application Apr. 29, 1976, Ser. No. 681,577

Claims priority, application France, Oct. 21, 1966, 66.81066; Sept. 1, 1967, 67.119682

Int. Cl.[2] C08F 4/02, 10/02

U.S. Cl. 526—124 14 Claims

1. A process for the polymerization and copolymerization of α-olefins which comprises conducting polymerization or copolymerization in the presence of a catalyst composition comprising

A. the solid reaction product of (1) a substantially anhydrous, solid, oxygenated magnesium compound containing less than 0.1 hydroxyl group per molecule, and (2) a liquid, halogen-containing transition metal compound selected from the group consisting of the chloride, bromide, and oxyhalide salt of titanium and vanadium, the solid reaction product having a halogen-to-transition metal atomic ratio higher than 3 and the reaction having been carried out so as to prevent the elimination of hydrogen halide from the reaction; and

B. an organometallic compound selected from the organic derivatives of the metals of Groups I, II, III, and IV of the Periodic Table and being present in a molar concentration greater than that of said transition metal.

4,056,669

POLYMERIZATION PROCESS

Denis George Harold Ballard; Eric Jones; John Christopher Padget; Alexander Joseph Peter Pioli; Peter Anthony Robinson; John Walker, and Ronald John Wyatt, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed July 9, 1973, Ser. No. 377,197

Claims priority, application United Kingdom, July 13, 1972, 32811/72

Int. Cl.[2] C08F 4/02, 10/02

U.S. Cl. 526—154 5 Claims

1. A process for the polymerisation of ethylene in which the ethylene is contacted with a catalyst comprising a transition metal composition which is the product of reacting a transition metal complex of general formula MR_m, where M is a metal of Group IVa, chromium or vanadium, R is selected from the group consisting of alkyl, alkenyl, and substituents of the formula $—CH_2Y$, where Y is selected from the group consisting of aromatic groups, polyaromatic groups and groups of formula $Z(R^1)_3$, where Z is silicon, germanium, tin or lead and each R^1 is hydrocarbon or hydrogen and m is an integer having a value equal to the valency of metal M, with particulate alumina which is free from adsorbed water, and which consists essentially of generally spherical particles, devoid of sharp edges, and has substantially no particles with diameters less than 20 μ.

4,056,670

ANAEROBIC ADHESIVE AND SEALANT COMPOSITIONS EMPLOYING AS A CATALYST α-AMINO SULFONE COMPOUND

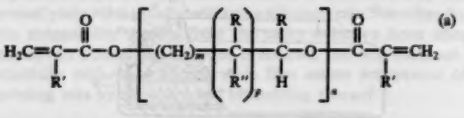
Martin M. Skoultchi, Somerset, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Nov. 3, 1975, Ser. No. 627,900

Int. Cl.[2] C08F 18/00, 4/04, 4/00

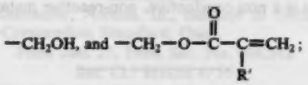
U.S. Cl. 526—320 9 Claims

1. An anaerobic curing composition stable when exposed to air consisting essentially of a mixture of a polymerizable acrylic or substituted acrylic monomer selected from the group consisting of



(a)

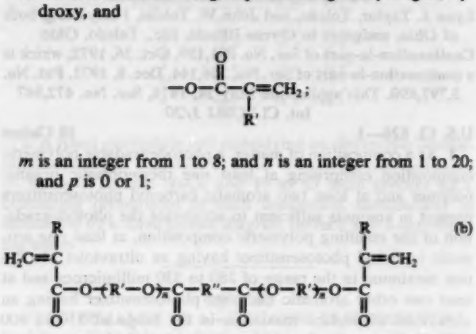
wherein R is selected from the group consisting of hydrogen, methyl, ethyl,



R′ is selected from the group consisting of hydrogen chlorine, methyl and ethyl;

R″ is selected from the group consisting of hydrogen, hydroxy, and

m is an integer from 1 to 8; and n is an integer from 1 to 20; and p is 0 or 1;



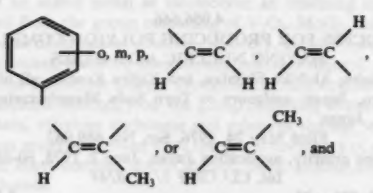
(b)

wherein

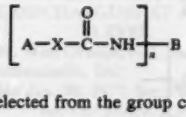
R represents hydrogen, chlorine, methyl or ethyl,

R′ represents alkylene with 2–6 carbon atoms,

R″ represents $(CH_2)_m$ in which m is an integer of from 0 to 8,



n represents an integer of from 1 to 4;

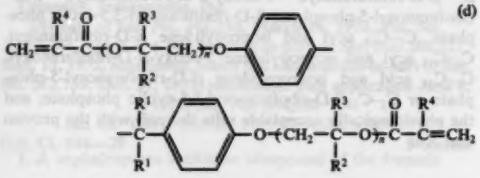


(c)

wherein X is selected from the group consisting of —O— and

and R is a member selected from the group consisting of hydrogen and lower alkyl of 1 to 7 carbon atoms, A represents the organic residue of an active hydrogen containing acrylic

ester wherein the active hydrogen has been removed, said ester being hydroxy or amino substituted on the alkyl portion thereof, and the methyl, ethyl and chlorine homologs thereof, *n* is an integer from 1 to 6, and B is a mono- or polyvalent organic radical selected from the group consisting of alkyl, alkylene, alkenyl, cycloalkyl, cycloalkylene, aryl, aralkyl, alkaryl, poly(oxyalkylene) poly(carboalkoxyalkylene), and heterocyclic radicals both substituted and unsubstituted

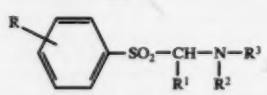


(d)

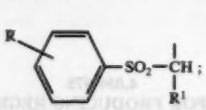
wherein R^1 is selected from the group consisting of methyl, ethyl, carboxyl and hydrogen, R^2 is selected from the group consisting of hydrogen, methyl and ethyl; R^3 is selected from the group consisting of hydrogen, methyl and hydroxyl; R^4 is selected from the group consisting of hydrogen, chlorine, methyl and ethyl and *n* represents an integer of from 0 to 8; and

e. monofunctional acrylate and methacrylate esters and the hydroxy, amide, cyano, chloro, and silane substituted derivatives thereof;

and from 0.05 to 5.0%, by weight of monomer, of an alpha-amino sulfone corresponding to the formula



where R is hydrogen or methyl; R^1, R^2 and R^3 are independently chosen from the group consisting of hydrogen; hydroxy; C_1–C_{20} alkyl; C_1–C_{20} alkyl substituted with chlorine, bromine, fluorine, dialkyl(C_1–C_6)amino, carboalkoxy (C_1–C_4) or alkoxy (C_1–C_4); C_6–C_{10} aryl; C_6–C_{10} aryl substituted with alkyl (C_1–C_4), chlorine, bromine, fluorine, dialkyl(C_1–C_6)amino, carboalkoxy (C_1–C_4) or alkoxy (C_1–C_4); dialkyl(C_1–C_6)amino, or either R_2 or R^3 may be



and wherein the alpha-amino sulfone is present in amount sufficient to initiate polymerization of said acrylic monomer at room temperature in the absence of air or oxygen.

4,056,671

STYRENE ACRYLONITRILE COPOLYMERS WITH HIGH DIMENSIONAL STABILITY UNDER HEAT

Heinrich Alberts, Cologne; Herbert Bartl, Odenthal-Hahnenberg, and Richard Prinz, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 530,169, Dec. 6, 1974, abandoned. This application May 6, 1975, Ser. No. 574,950
Claims priority, application Germany, Dec. 12, 1973, 2361743
Int. Cl.² C08F *210/00, 212/00*
U.S. Cl. 526—342 **3 Claims**

1. A copolymer of improved dimensional stability consisting essentially of

a. 5 to 85% by weight of acrylonitrile or methacrylonitrile,

b. 14.99 to 94.5% by weight of styrene and

c. 0.01 to 0.5% by weight of an aliphatic monoolefin having 2 to 18 carbon atoms.

4,056,672

POLYMER PREPARED BY CYANHYDRIN METHOD

Alf-Göran Dahlberg, Nykvarn; Karl Gustav Högberg, Sodertalje; Sven Lindvall, Sodertalje, and Thore Oskar Verner Rydh, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Division of Ser. No. 343,690, March 22, 1973, Pat. No. 3,928,581. This application May 9, 1975, Ser. No. 576,152
Int. Cl.² A61K *31/70*; C07H *15/08*
U.S. Cl. 536—1 **26 Claims**

2. A polymer suitable for being administered parenterally which has been prepared by

A. reacting in an aqueous solution at a temperature between about 20° C and the boiling point of the reaction mixture

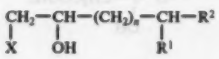
1. about 0.1 to 1.0 moles of a saccharide (per mole of component (3) below) which is selected from the group consisting of

a. sucrose,

b. trehalose, and

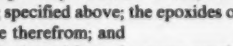
c. raffinose;

2. about 0.05 to 5 moles of a polymerization agent (per mole of component (3) below) of the formula



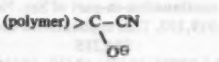
wherein *n* is an integer selected from the group consisting of 0, 1, 2, 3 and 4; X is selected from the group consisting of Cl, Br and I; R^1 is selected from the group consisting of OH, Cl, Br and I; and R^2 is selected from the group consisting of H and CH_2X with the proviso that R^2 is CH_2X only when R^1 is OH, wherein X has the meaning specified above; the epoxides or the diepoxides derivable therefrom; and

3. a hexitol selected from the group consisting of sorbitol, hydroxypropyl sorbitol, mannitol, talitol, iditol, galactitol, and allitol to from a first intermediate of the formula



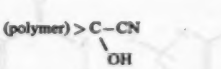
(I);

B. reacting said first intermediate product with a cyanide selected from the group consisting of KCN, NaCN, $Ca(CN)_2$, HCN, and NH_4CN in an amount at least equimolar with the amount of carbonyl groups on the first intermediate product to form a second intermediate product of the formula



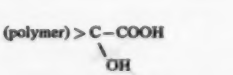
(II);

C. acidifying said second intermediate product to from a third intermediate product of the formula



(III);

D. hydrolyzing said thrid intermediate product to form a water swellable polymer of the formula



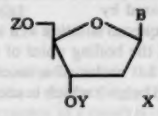
(IV).

4,056,673
PHOSPHONOACETIC ACID DERIVATIVES OF NUCLEOSIDES

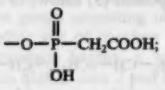
Edgar Philip Heimer, Cedar Grove, and Alexander Leopold Nussbaum, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed July 16, 1976, Ser. No. 706,041
Int. Cl.[2] C07H *19/10, 19/20*
U.S. Cl. 536—27 13 Claims

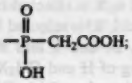
1. A compound of the formula



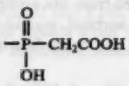
wherein B is selected from (a) the group of nucleobases consisting of adenine, guanine, cytidine, thymidine and uracil or (b) a 5-halopyrimidine; X is hydrogen, hydroxy, or



Y is hydrogen or



and Z is



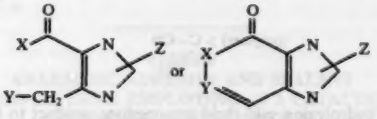
or, when either of X and Y is other than hydrogen or hydroxy, is hydrogen: and pharmaceutically acceptable base salts thereof.

4,056,674
DERIVATIVES OF 3-DEAZAGUANINE

Roland K. Robins, Santa Ana; Robert J. Rousseau, Laguna Niguel, and Abdul M. Mian, Los Angeles, all of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

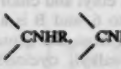
Continuation-in-part of Ser. No. 377,078, July 6, 1973, Pat. No. 3,896,135, and a continuation-in-part of Ser. No. 377,079, July 6, 1973, Pat. No. 3,919,193. This application June 5, 1975, Ser. No. 584,215
Int. Cl.[2] C07H *19/06, 19/10, 19/16, 19/20*
U.S. Cl. 536—28 14 Claims

1. A compound of the structure

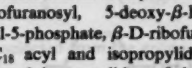


wherein X is

—NH_2 or —OCH_3; Y is



or —C≡N where R is H or acyl and R^1 is =Ch—$N(CH_3)_2$; Z is β-D-ribofuranosyl, 5-deoxy-β-D-ribofuranosyl, β-D-ribofuranosyl-5-phosphate, β-D-ribofuranosyl-3,5-cyclic phosphate, C_1–C_{18} acyl and isopropylidene β-D-ribofuranosyl, C_1–C_{18} acyl and isopropylidene 5-deoxy-β-D-ribofuranoxyl, C_1–C_{18} acyl and isopropylidene β-D-ribofuranosyl-5-phosphate or C_1–C_{18}β-D-ribofuranosyl-3,5-cyclic phosphate; and the physiologically acceptable salts thereof; with the proviso that X is



only when X and Y are joined together; and X is —NH_2 or —OCH_3 and Y is —C≡N only when X and Y are not joined together; and Z is not β-D-ribofuranosyl or C_1–C_{18} acyl β-D-ribofuranosyl when Y is

where R is H.

4,056,675
PROCESS FOR PRODUCING REGENERATED CELLULOSIC FIBERS

Albin Frank Turbak, Convent Station, and Richard Benjamin Hammer, Morris Plains, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,132
Int. Cl.[2] C08B *16/00*
U.S. Cl. 536—57 6 Claims

1. A process for producing a regenerated cellulosic fiber of improved alkaline resistance comprising

nitrosating cellulose with a nitrosating agent selected from the group consisting of an oxide of nitrogen and nitrosyl chloride and dissolving from 5 to 14% by weight of the cellulose in a dialkylacylamide solvent to form a solution of cellulose nitrite ester while said solution is maintained at a temperature no greater than 20° C. and

regenerating said cellulose by contacting the cellulose ester solution with a regenerant therefor containing a protonic group, the time at temperature of said cellulose ester solution from completion of dissolution to regeneration ranging from a maximum of 2 hours at a temperature not exceeding 20° C. to a maximum of 60 hours at a tempera-

ture below 0° C., said regeneration occurring before significant oxidation of said cellulose takes place.

4,056,676

HALOGENATED PHENYLTHIOACETAMIDO CEPHALOSPORINS

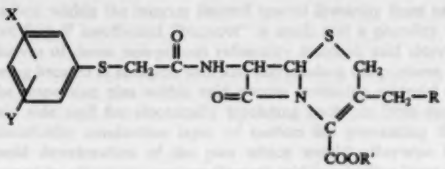
George W. Huffman, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 341,210, March 14, 1973, Pat. No. 3,907,784, which is a continuation-in-part of Ser. No. 288,227, Sept. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 212,739, Dec. 27, 1971, abandoned. This application June 9, 1975, Ser. No. 584,998

Int. Cl.[2] C07D *501/28, 501/40;* A61K *31/545*

U.S. Cl. 544—29 5 Claims

1. A cephalosporin antibiotic compound of the formula

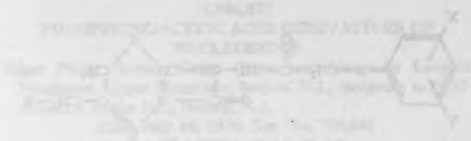


in which

R′ is hydrogen, dicyclohexylamine, or a pharmaceutically acceptable cation;

R is selected from the group consisting of hydrogen, C_1 to C_4-alkanoyloxy, and N-pyridino;

and X and Y are chlorine and are in the 3,4-, the 3,5-, or the 2,5-positons.

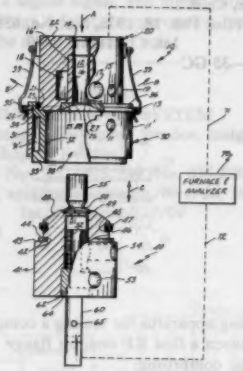


4,056,677

ELECTRODE SYSTEM FOR RESISTANCE FURNACE

Charles W. Berk, St. Joseph, and Charles B. Vallance, Berrien Springs, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Apr. 19, 1976, Ser. No. 677,930
Int. Cl.[2] H05B *3/08;* F27D *11/02*
U.S. Cl. 13—23 15 Claims



1. An electrode system for use in a resistance furnace employing a resistive crucible for combusting a specimen positioned in the crucible, said system comprising:

a pair of opposed electrodes of electrically conductive material, one of said electrodes being movable for selectively holding a crucible between said pair of electrodes; and

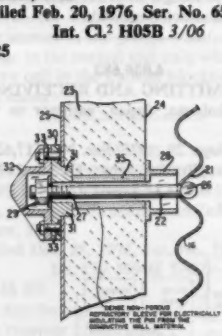
an intermediate electrode section including a central cavity for receiving a crucible, said intermediate electrode section demountably coupled to one electrode of said pair of electrodes to facilitate cleaning of said electrode system when said intermediate electrode section is removed.

4,056,678

ELECTRIC HEATING FURNACE

Benjamin S. Beall, III, Lake Forest, and Russell F. Novy, Northbrook, both of Ill., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Feb. 20, 1976, Ser. No. 659,676
Int. Cl.[2] H05B *3/06*
U.S. Cl. 13—25 5 Claims



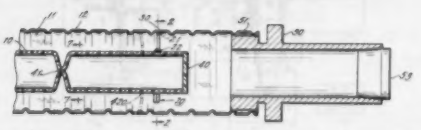
1. In an electric heating furnace for heat treatment having a body with side walls of porous insulating material defining a chamber therein to receive material for heat treatment, the improvement comprising a conductive electric heating resistance strip within said chamber adjacent to the inner hot face of a side wall of porous insulating material for electrically heating said chamber, a plurality of pins each extending through said side wall and being connected to said resistance strip, said porous insulating material of said side wall being subject to the build up of an electrically conductive layer of carbon within the interior thereof spaced inwardly from said hot face if insufficient "burnout" is used, and a plurality of sleeves of dense non-porous refractory material, said sleeves being located in said side wall and surrounding the portions of the respective pins within said porous insulating material of said side wall for electrically insulating each pin from such electrically conductive layer of carbon for preventing the rapid deterioration of the pins which would otherwise be caused by electricity passing through said conductive layer of carbon forming an electrically conductive path.

4,056,679

SODIUM FILLED FLEXIBLE TRANSMISSION CABLE

Thomas F. Brandt, Swarthmore; Philip C. Netzel, Milmont Park, both of Pa., and Lennard Wharton, Winnetka, Ill., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Sept. 27, 1976, Ser. No. 726,847
Int. Cl.[2] H01B *5/00, 9/00;* H02G *15/02*
U.S. Cl. 174—13 11 Claims



1. A conductor having an outer longitudinal relatively thin electrically conductive casing and an interior electrically conductive metal in said casing in electrically conductive contact therewith;

the said interior electrically conductive metal having a different coefficient of thermal expansion than the outer relatively thin conductive casing;

a core member substantially axially positioned along the interior of said outer casing;

said interior electrically conductive metal filling the space between said outer electrically conductive casing and said core member;

said core member being radially flexible and resilient;

said core member being resiliently compressed when said interior metal expands;

said core member expanding when said interior metal contracts; said core member remaining in contact with said interior metal, preventing the occurrence of voids in said interior metal between said interior metal and said core member and between said interior metal and said casing while absorbing pressures that may be generated by the difference in coefficient of expansion of the interior metal and said casing.

4,056,680

TERMINATION OF D.C. HIGH TENSION ELECTRIC CABLES AND METHOD OF MANUFACTURING SAME

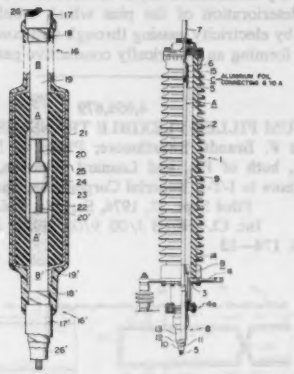
Mitsugu Aihara, Yokohama; Yutaka Kogane, Kawasaki; Yasumitsu Ebinuma, Tokyo, and Masaki Minami, Yokohama, all of Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Kawasaki, Japan

Filed Apr. 6, 1976, Ser. No. 674,163
Claims priority, application Japan, Apr. 11, 1975, 50-43941
Int. Cl.[2] H02G *15/22, 1/14, 15/24;* G01R *31/20*
U.S. Cl. 174—19 15 Claims

1. A d.c. high tension cable termination comprising an electric conductor, an electrically insulating layer concentrically applied over the electric conductor, and a semi-conductive layer concentrically applied over the insulating layer in close contact therewith, the semi-conductive layer including an area adjacent to an end of the insulating layer which is impregnated with an electrically insulating liquid so as to present an electrical resistivity which is higher than that of the remainder of the semi-conductive layer which is not impregnated with the

liquid and which is lower than that of the insulating layer, the electric conductor being electrically connected with that end of the impregnated area of the semi-conductive layer which is located nearer the conductor.

9. A method of forming a termination for a d.c. high tension cable which includes an electric conductor successively covered in concentric manner with an electrically insulating layer,



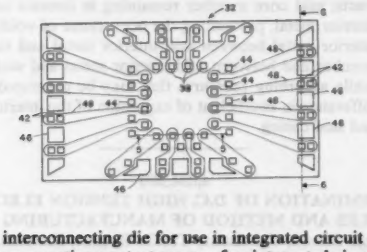
a semi-conductive layer, and at least one additional layer, the method comprising the steps of stripping the additional layer or layers from an end of the cable to expose the semi-conductive layer, applying an electrically insulating liquid to an exposed area of the semi-conductive layer which is located adjacent to a cable end to impregnate the semi-conductive layer with the liquid, and electrically connecting the impregnated semi-conductive layer with the conductor.

4,056,681

SELF-ALIGNING PACKAGE FOR INTEGRATED CIRCUITS

Charles R. Cook, Jr., North Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 4, 1975, Ser. No. 601,854
Int. Cl.[2] H05K *5/00*
U.S. Cl. 174—52 FP **69 Claims**



1. An interconnecting die for use in integrated circuit packaging for connecting contact means of an integrated circuit die with contact means of an integrated circuit package, said interconnecting die comprising:

a substrate of anodizable electrically conductive material including unanodized conducting regions and anodized non-conducting regions;

first contact means associated with said substrate to contact the contact means of the integrated circuit die when placed in juxtapostion and properly aligned with the integrated circuit die; and

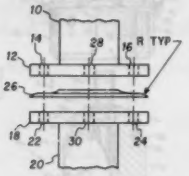
second contact means associated with said substrate to contact the contact means of the integrated circuit package when placed in juxtaposition and properly aligned therewith, said conducting regions of the substrate being formed and arranged for electrically connecting said first and second contact means of the interconnecting die, whereby the contact means of the integrated circuit die and the contact means of the package may be connected using a single element with a minumum of bonding steps.

4,056,682

GASKET APPARATUS

Charlie C. Havens, Garland, and James A. Rutelonis, Plano, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 18, 1976, Ser. No. 658,954
Int. Cl.[2] H05K *9/00*
U.S. Cl. 174—35 GC **1 Claim**



1. RF sealing apparatus for sealing a connection upon compression between a first RF conduit flange and a second RF conduit flange comprising:

a thin flexible electrically conducting substantially planar structure having a central opening therein alignable with a hole in said conduit and having a plurality of fastener passageways;

an inside edge, defining said opening, angularly disposed from said planar structure to provide high pressure contact with said first flange;

an inside curved contact area adjacent said inside edge to engage said second flange, for providing, under deformation, a high pressure contact therewith, the inside curved contact completely circumscribing said opening between said inside edge and said plurality of fastener passageways;

an outside edge circumscribing said plurality of fastener passageways angularly disposed from said planar structure to produce high pressure contact with second flange; and

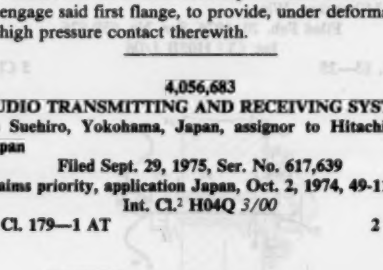
an outside curved contact area adjacent said outside edge to engage said first flange, to provide, under deformation, a high pressure contact therewith.

4,056,683

AUDIO TRANSMITTING AND RECEIVING SYSTEM

Akio Suehiro, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 29, 1975, Ser. No. 617,639
Claims priority, application Japan, Oct. 2, 1974, 49-112756
Int. Cl.[2] H04Q *3/00*
U.S. Cl. 179—1 AT **2 Claims**



1. An audio transmitting and receiving system comprising an

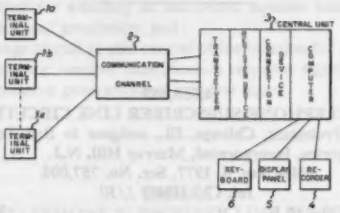
audio response unit for reading out prerecorded audio information and editing it to required information, transmission means for transmitting the edited information, and conversion means at a receiving side for converting the transmitted information into an analog audio signal, the improvement in that the audio response unit includes means for editing the audio information in digital signal form to produce a digital signal; further comprising conversion means for converting audio information for interruption into a digital signal, and digital mixer means for mixing the digital signal from the conversion means with the digital signal of the audio response unit.

4,056,684

SURVEILLANCE SYSTEM

Arne David Lindstrom, Jonkoping, Sweden, assignor to Saab-Scania AB, Jonkoping, Sweden

Filed Nov. 25, 1975, Ser. No. 635,228
Claims priority, application Sweden, Nov. 26, 1974, 7414814
Int. Cl.² H04M *11/04*
U.S. Cl. 179—5 R **15 Claims**



1. In a surveillance system which comprises a central unit connected, by the intermediary of a communication channel to a plurality of local terminal units in order to receive information from these units concerning changes of status in sensors connected to said terminal units, the improvement wherein said terminal unit comprises:

a. a transfer blocking register with a memory cell for each sensor in at least one group of the sensors connected to said terminal unit, said memory cells having two states and being switchable between these states by control information transferred from said central unit; and

a sensing device for achieving, on a change of status in any one of the sensors of the group, transfer of information on such change to the central unit only when the corresponding memory cell in the transfer blocking register is in one of its two states.

4,056,685

SIGNAL DISTRIBUTING AND MUTING SYSTEM FOR MULTIPLE CHANNEL FM STEREO SYSTEM

Lajos Burgyan, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 29, 1976, Ser. No. 755,367
Int. Cl.² H04H *5/00*
U.S. Cl. 179—15 BT **5 Claims**

1. A signal distributing and muting system for a multiple-channel stereo receiver comprising:

a source of composite baseband signal;

a source of bias potential;

a plurality of demodulators responsive to said composite baseband signal and to said source of bias potential for developing a like plurality of audio difference components, each of said demodulators comprising a differential amplifier;

a composite signal distributor having an input terminal coupled to said source of composite baseband signal,

a first output terminal for applying said composite signal to one of said demodulators, and

a second output terminal for applying said composite signal to the other ones of said demodulators;

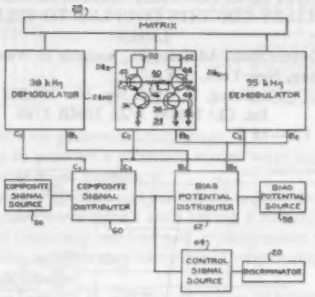
a bias potential distributor connected to said source of bias potential and having a first output terminal for applying operating bias potential to said one demodulator and

a second output terminal for applying operating bias potential to said other ones of said demodulators;

a source of control signal, said control signal having a predetermined first amplitude indicative of detection by said receiver of a multiple-channel related pilot signal and having a predetermined different amplitude indicative of failure to detect such pilot signal; and

switch means coupled to said second output terminals of said composite signal distributor and said bias potential distributor and responsive to a control signal of said predetermined first amplitude to maintain a coupling between said second output terminals and said other demodulators to render said other demodulators operative

and responsive to a control signal of said predetermined different amplitude to render said other demodulators quiescent by effectively decoupling said composite signal from said other demodulators while simultaneously controlling the bias potentials applied concurrently to each of said other demodulator differential amplifiers so that the power consumed by said other demodulator differential amplifiers during said quiescent condition remains substantially the same as the power consumed by them during their operative condition.

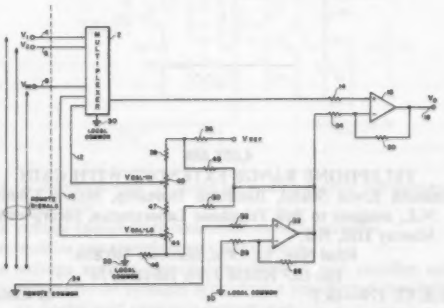


4,056,686

MULTIPLEXED SIGNAL REFERENCE LEVEL EQUALIZER

Martin Zielinski, Roslyn, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 12, 1976, Ser. No. 731,507
Int. Cl.² H04J *3/04*
U.S. Cl. 179—15 BL **6 Claims**



6. A method for multiplexing remote and local signals comprising the steps of selecting ones of remote and local input

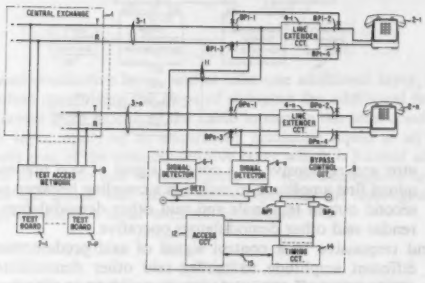
signals, generating a common mode signal representing the difference between a common signal level of the remote input signals and a common signal level of the local input signals, adding the common mode signal to the local input signals and subtracting the common mode signal from the selected ones of the remote and local input signals.

4,056,687

DECOUPLING CONTROL ARRANGEMENT FOR AUXILIARY CIRCUITS COUPLED TO TELEPHONE LINES

Robert Dennis Sims, Addison, Ill., assignor to Western Electric Company, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,592
Int. Cl.² H04M 3/22; H04B 3/46
U.S. Cl. 179—16 F **32 Claims**



1. For use in a system including a plurality of telephone lines coupled to a different auxiliary circuit and means for decoupling each auxiliary circuit from its respective line, a circuit for controlling each of said decoupling means, said controlling circuit comprising

means for operating individual ones of said decoupling means upon receipt of request signals individually associated therewith,

means responsive to a first said request signal for holding operated an associated one of the decoupling means for at least a prescribed time interval, and

means responsive to a subsequent said request signal received during said prescribed time interval for controlling said holding means to hold operated each operated said decoupling means for at least another said prescribed time interval.

4,056,688

TELEPHONE RANGE EXTENDER WITH GAIN

Kenneth Erwin Stiefel, Randolph Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

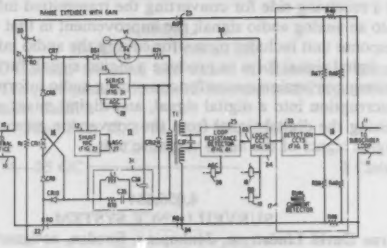
Filed Nov. 11, 1976, Ser. No. 740,854
Int. Cl.² H04M 1/76; H04B 3/16
U.S. Cl. 179—16 F **11 Claims**

6. A bilateral amplifier in the form of a π network comprising

a shunt negative impedance converter;

a series negative impedance converter;

a shunt impedance transformer; and



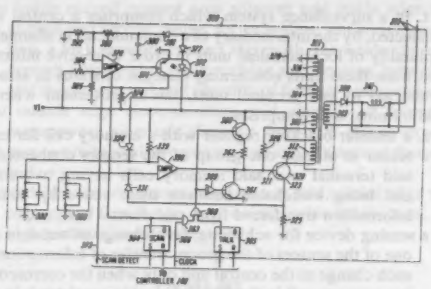
a fixed impedance matching network connected between said shunt negative impedance converter and said shunt impedance transformer.

4,056,689

TELEPHONE SUBSCRIBER LINE CIRCUIT

Laimons Freimanis, Chicago, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 5, 1977, Ser. No. 757,005
Int. Cl.² H04Q 1/30
U.S. Cl. 179—16 F **8 Claims**



1. A current supply circuit comprising:

a transformer having a primary winding connectable to an electrical power source and a secondary winding connectable to an electrical load;

a switching device connected to said primary winding for controlling current flow in said primary winding;

a first sense winding magnetically coupled to said primary and secondary windings and connected to said switching device for controlling said switching device to allow current flow in said primary winding;

a second sense winding magnetically coupled to at least said secondary winding for generating output signals representative of current flow in said secondary winding;

sensing means for sensing current flow in said primary winding and for generating output signals representing current flow in said primary winding; and

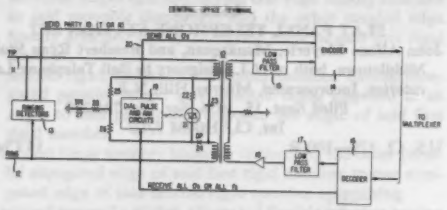
a comparator circuit having a first input terminal connected to said second sense winding, a second input terminal connected to said sensing means, and an output terminal connected to said switching device and responsive to said signals from said second sense winding and said sensing means for turning off said switching device.

4,056,690

AUTOMATIC NUMBER IDENTIFICATION IN SUBSCRIBER LOOP CARRIER SYSTEMS

Stephen Joseph Brolin, Livingston, and Samuel Colodner, Succasunna, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 14, 1976, Ser. No. 732,343
Int. Cl.[2] H04M 15/36
U.S. Cl. 179—17 A 10 Claims



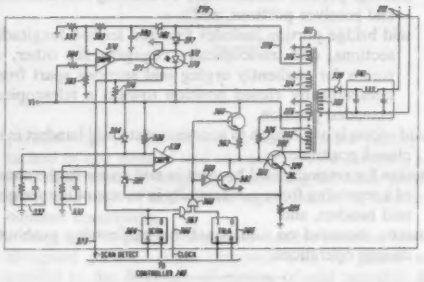
6. An automatic number identification circuit comprising
a timing circuit at a central office location with a timed output for enabling an automatic number identification test signal generation; and
a storage circuit at said central office location for storing an automatic number identification response signal between successive generations of said test signal.

4,056,691

TELEPHONE SUBSCRIBER LINE CIRCUIT

Laimons Freimanis, Chicago; Harry Edward Mussman, Glen Ellyn, and DeWitt Paul Smith, Naperville, all of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 5, 1977, Ser. No. 757,006
Int. Cl.[2] H04Q 1/28
U.S. Cl. 179—18 FA 12 Claims



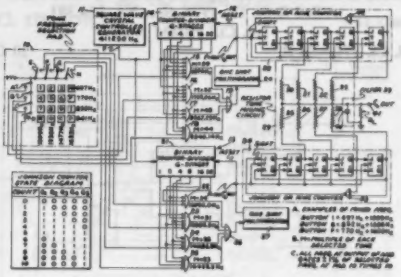
1. A line interface circuit for detecting both off-hook and dial pulse signaling on a line comprising:
a constant current power supply having an output transformer;
a sense winding magnetically coupled to said transformer;
a source of reference potential;
a comparator circuit having one input connected to said sense winding and another input connected to said source of reference potential;
circuit means connected between said sense winding and said source of reference potential and responsive to the potential induced in said sense winding; and
signal generating means alternatively responsive to said comparator circuit and said circuit means to generate an output signal.

4,056,692

DIGITAL TONE GENERATOR

Harry Place, Ridgewood, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 2, 1976, Ser. No. 710,513
Int. Cl.[2] H04M 1/50
U.S. Cl. 179—84 VF 41 Claims



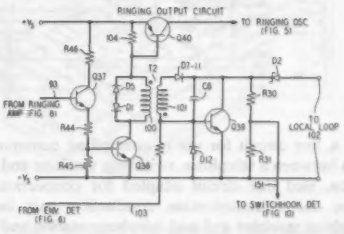
1. A digital tone generator comprising:
first means to generate a reference square wave signal having a stable given frequency;
second means coupled to said first means to provide a plurality of square wave signals each having a different predetermined frequency, each of said predetermined frequencies having a different predetermined relationship to said given frequency;
third means coupled to said second means to select at least one of said plurality of square wave signals; and
fourth means coupled to said second means responsive only to said selected one of said plurality of square wave signals to provide as an output signal of said generator one sine wave tone having a frequency equal to said predetermined frequency divided by a given factor greater than two of said selected one of said plurality of square wave signals.

4,056,693

VOLTAGE AND CURRENT CONTROLLED CONVERTER FOR TELEPHONE RINGING

Barry Sheldon Bosik, Parsippany, and Dale Eugene Stone, Cedar Knolls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 638,163, Dec. 5, 1975, Pat. No. 4,002,838.
This application Aug. 26, 1976, Ser. No. 718,081
Int. Cl.[2] H04M 1/26; H02H 7/10
U.S. Cl. 179—84 R 4 Claims



1. A direct current to direct current converter comprising an oscillator,
a voltage transformer connected to said oscillator,
a rectifier connected to said transformer,
a voltage sensing circuit connected to said rectifier and responsive to voltages exceeding a preselected threshold to disable said oscillator output, and
a current sensing circuit connected to said transformer and responsive to currents exceeding a preselected threshold

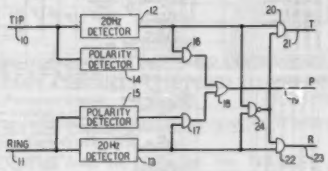
to disable said oscillator for the balance of the half-cycle of said oscillator.

4,056,694

TELEPHONE RINGING DETECTORS

Stephen Joseph Brolin, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 17, 1976, Ser. No. 724,381
Int. Cl.[2] H04M *1/26*
U.S. Cl. 179—84 R **10 Claims**



1. A detector for alternating current signals superimposed on a preselected polarity of direct current voltage comprising

an alternating current detector;

a direct current polarity detector; and

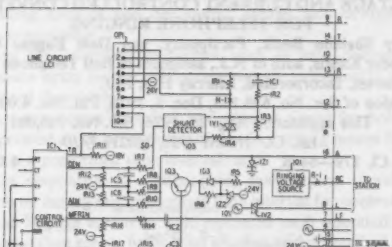
means for enabling the operation of said direct current detector only in the presence of an output from said alternating current detector.

4,056,695

KEY TELEPHONE LINE CIRCUIT TONE-ON-HOLD ARRANGEMENT

Ronald Joseph Angner, Freehold, and James Volney Lacy, Red Bank, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1976, Ser. No. 708,858
Int. Cl.[2] H04M *1/72*
U.S. Cl. 179—99 **11 Claims**



1. A line circuit for use in controlling communication services between a telephone switching machine and a telephone station, said line circuit adapted for connection in parallel across the communication conduction pair between said switching machine and said telephone station and adapted for A-lead control from said station, said line circuit including

hold and ringing control means,

a source of clock signals,

means controlled by said clock signals for detecting both A-lead signal changes, and communication lead signal changes and

for comparing detected A-lead signals with detected communication lead signals, and

for enabling selected ones of said hold or ringing control means,

audio coupler means,

means for generating from said clock signals a signal having a duty cycle, such that when said generated signal is applied to said audio coupler means a distinctive audio tone results, and

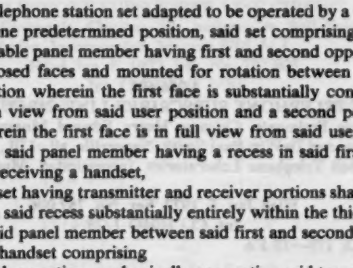
means for optionally coupling said generated audio signal to said communication leads through said audio coupler when said hold means is enabled.

4,056,696

FLAT PANEL TELEPHONE STATION SET

John Alfons Meyerle, Manasquan, and Rembert Ryan Stokes, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 15, 1976, Ser. No. 723,230
Int. Cl.[2] H04M *1/02*
U.S. Cl. 179—100 R **15 Claims**



1. A telephone station set adapted to be operated by a user in at least one predetermined position, said set comprising

a rotatable panel member having first and second oppositely disposed faces and mounted for rotation between a first position wherein the first face is substantially concealed from view from said user position and a second position wherein the first face is in full view from said user position, said panel member having a recess in said first face for receiving a handset,

a handset having transmitter and receiver portions shaped to fit in said recess substantially entirely within the thickness of said panel member between said first and second faces, said handset comprising

a bridge portion mechanically connecting said transmitter and receiver portions, and

said bridge portion includes first and second longitudinal sections, one telescopically engaging the other, and means for resiliently urging said sections apart from a telescopically closed position toward a telescopically extended position,

said recess is of a length to accommodate said handset in said closed position,

means for retaining said handset in said recess in the absence of a removing force substantially in excess of the weight of said handset, and

means, mounted on said panel, for performing pushbutton dialing operations.

4,056,697

MOVABLE DIAPHRAGM CONNECTOR METHOD FLEXIBLE HINGE DIAPHRAGM SURROUND AND ELECTRO-ACOUSTIC TRANSDUCER WITH FOLDED DIAPHRAGM WITH INTERMEDIATE FLEXIBLE PORTIONS

Oskar Heil, 1775 Parrott Drive, San Mateo, Calif. 94402

Filed Sept. 3, 1976, Ser. No. 720,279
Int. Cl.[2] H04R *7/12, 7/18, 9/02*
U.S. Cl. 179—115.5 PV **3 Claims**

1. A connector for a movable diaphragm comprising

a fixed member,

a movable diaphragm member having a planar axis and adapted to move in a direction perpendicular to said planar axis relative to said fixed member,

a first rigid, generally elongated member having elongated

parallel edges, said member being disposed at an angle to said planar axis about the periphery of said movable diaphragm,

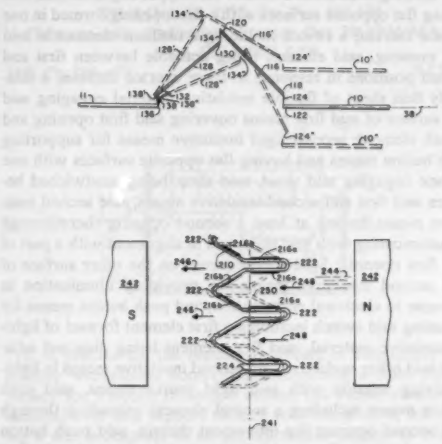
a first hinge member hingedly connecting one elongated edge of said first rigid elongated member to said movable diaphragm comprising

a first generally planar, elongated flexible member having elongated parallel edges, said member disposed with its planar axis parallel to the direction of motion of said movable diaphragm and having one edge fixedly attached to said movable diaphragm and the other parallel edge fixedly attached to one elongated edge of said first rigid member,

a second rigid, generally elongated member having elongated parallel edges, said member being disposed at an angle to said planar axis opposite the angle of said first rigid member,

a second hinge member hingedly connecting the other parallel elongated edge of said first rigid member to one elongated edge of said second rigid member comprising

a second generally planar, elongated flexible member having elongated parallel edges disposed with its planar axis parallel to the direction of motion of said movable diaphragm and having one edge fixedly attached to the other parallel edge of said first rigid member and the other



parallel edge of said second flexible member fixedly attached to one edge of said second movable member, and

a third hinge member hingedly connecting the other parallel elongated edge of said second rigid member to said fixed member comprising

a third generally planar, elongated flexible member having elongated parallel edges disposed with its planar axis parallel to the direction of motion of said movable diaphragm and having one edge fixedly attached to the other parallel edge of said second rigid member, and the other parallel edge of said third flexible member fixedly attached to said fixed member.

2. An electro-acoustic transducer comprising

a plurality of parallel arranged, elongated, narrow, generally planar pairs of first and second rigid members,

a first hinge member hingedly connecting said pair of first and second rigid members to each other,

a second hinge member hingedly connecting said pairs of rigid members to adjacent pairs of rigid members,

said pairs of rigid members alternately folded at said second hinge member to define a plurality of angular corrugations having adjacent narrow open air spaces facing in opposite directions, and

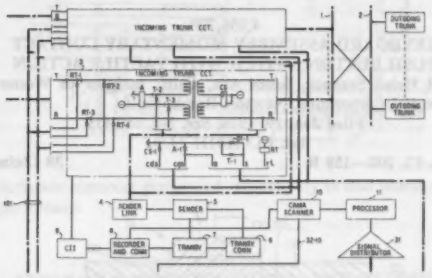
means for moving alternate adjacent first hinge members toward and away from each other.

4,056,698

SPECIAL AUTOMATIC TRUNK TESTING ARRANGEMENT

Francis Stanislaus Dworak, Oceanport, N.J., and Renald Anthony Ratti, Westerville, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 20, 1976, Ser. No. 678,689
Int. Cl.[2] H04M 3/22
U.S. Cl. 179—175.2 C **11 Claims**



1. In an automatic trunk testing system having means for registering the identity of a trunk to be seized for transmission path testing and means responsive to said registering means for verifying that said trunk is idle before said trunk is so seized, the improvement comprising

means responsive to a special test control signal for locking the identity of a seized trunk in said registering means;

means for releasing said so-seized trunk;

means for by-passing said idle verifying means; and

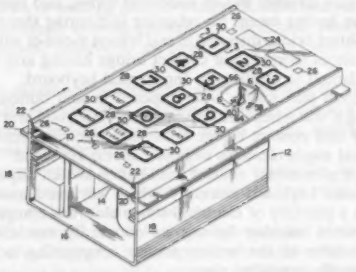
means for thereafter seizing a trunk identified by said special test control signal to perform transmission path testing thereon irrespective of the busy or idle state thereof.

4,056,699

TOUCH PLATE ASSEMBLY

Leslie S. Jordan, Logansport, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.

Filed Nov. 13, 1975, Ser. No. 631,596
Int. Cl.[2] H01H 9/26
U.S. Cl. 200—5 A **7 Claims**



5. A touch plate assembly for entering information into a digital control circuit, comprising:

a flat dielectric plate having front and back faces;

a plurality of touch switches on said dielectric plate;

contact areas on said back face, said contact areas being electrically connected to said touch switches;

a printed circuit board containing circuitry for detecting the activation of said touch switches;

a plurality of bifurcated contacts extending from said printed circuit board toward said dielectric plate, said bifurcated contacts being electrically connected to said circuitry and

abutting against said contact areas to electrically connect said circuitry and said touch switches;

housing means for holding said dielectric plate and said printed circuit board substantially parallel to one another, said housing means including first means for engaging a first edge of said flat dielectric plate and a first edge of said printed circuit board, and second means for engaging the opposite edge of said flat dielectric plate and the opposite edge of said printed circuit board.

4,056,700

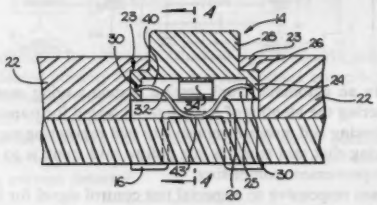
KEYBOARD ASSEMBLY MOMENTARY CONTACT PUSH BUTTON SWITCH WITH TACTILE ACTION

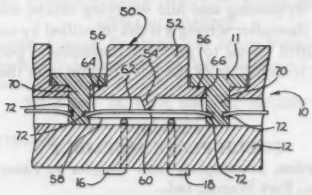
Karl Heinz Stannek, Santa Ana, Calif., assignor to Western Digital Corporation, Newport Beach, Calif.

Filed Jan. 19, 1976, Ser. No. 650,419

Int. Cl.[2] H01H *13/52*

U.S. Cl. 200—159 R **38 Claims**





18. A spring actuated push button switch keyboard adapted for use in a keyboard assembly which assembly includes a plurality of electrical staple elements comprising:

a button member and an associated spring, said button member having means for retaining said spring therein; and

a contact bridge disposed in said button member adjacent the bottom thereof, said contact bridge having arm members adapted to electrically engage said keyboard;

wherein said spring is so disposed in said button member such that when said button is depressed, said arm members of said contact bridge come into electrical contact with said staple elements disposed in said keyboard.

31. A momentary contact push button switch disposed in an associated keyboard assembly which keyboard assembly includes a plurality of electrical staple elements comprising:

a button member having an outwardly extending ledge member at the bottom thereof terminating in a downwardly extending rim;

a contact bridge disposed in said button member, said contact bridge having downwardly extending arm members for making an electrical contact with said staple elements; l

a sinusoidal-shaped spring having two arcuous branch sections forming a central, downward extending trough section, said branch sections coupled to said rim on the inside surface thereof such that when said button member is depressed, said arm members on said contact bridge come into electrical contact with said staple elements; and

wherein said keyboard assembly is comprised of a top framework having a plurality of openings for said button members, and a bottom circuit board coupled to said top framework, said top framework having outwardly extending arm member for engaging and retaining said button member therein, and said bottom circuit board containing said stape elements.

4,056,701

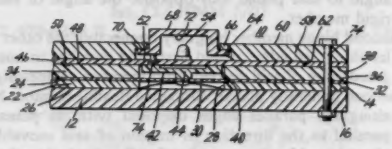
LOW PROFILE LIGHTED PUSH BUTTON SWITCH

John E. Weber, Fort Wayne, Ind., assignor to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed July 8, 1976, Ser. No. 703,526

Int. Cl.[2] H01H *3/12*

U.S. Cl. 200—314 **13 Claims**



1. In a low profile, lighted push button-type switch assembly: first rigid insulative means for supporting a switch and having flat opposite surfaces with a first opening formed in one surface thereof; a switch including a resilient element in said first opening, said element being actuable between first and second positions in response to force exerted thereon; a relatively thin sheet of flexible insulating material engaging said one surface of said first means covering said first opening and switch element; second rigid insulative means for supporting push button means and having flat opposite surfaces with one surface engaging said sheet, said sheet being sandwiched between said first and second insulative means, said second insulative means having at least a second opening therethrough communicating with said sheet and in alignment with a part of said first opening; light source means on the other surface of said second insulative means for providing illumination in response to electrical energization; and push button means for actuating said switch including a first element formed of light-transmissive material, said first element being disposed adjacent said other surface of said second insulative means in light-receiving relation with said light source means, said push button means including a second element extending through said second opening for movement therein, said push button means also including a third element aligned with said first opening for engaging said sheet in response to depression of said push button means thereby to apply force on said switch element for actuating the same between said positions thereof.

4,056,702

ELECTRICAL DISCHARGE MACHINING POWER CIRCUIT

Oliver A. Bell, Jr., Mooresville; Randall C. Gilleland, Troutman, and Davey J. Chance, Concord, all of N.C., assignors to Colt Industries Operating Corporation, New York, N.Y.

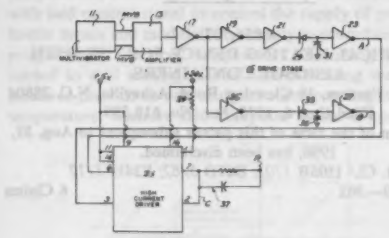
Filed Dec. 29, 1975, Ser. No. 644,447

Int. Cl.[2] B23P *1/08*

U.S. Cl. 219—69 C **6 Claims**

5. In an electrical discharge machining apparatus for machining a conductive workpiece by means of electrical discharges between an electrode and a workpiece across a dielectric filled gap, a source of voltage, a transistor connected in series with said source and said gap, a pulse generator, and a drive stage connected intermediate said pulse generator and said transistor, said drive stage further including a pair of parallel branches each branch having a different set of series inverters for providing square wave out-of-phase signals from

the pulse generator output, and a high current push-pull driver device having a pair of input terminals connected intermediate



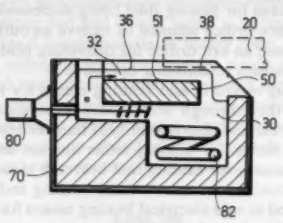
said branches and its output coupled to said transistor for providing turn-on and turn-off of said transistor.

4,056,703

PROCESS AND APPARATUS FOR RESISTANCE HEATING OF ELECTRICALLY CONDUCTIVE WORKPIECES

Andor Mándoki, Budapest, Hungary, assignor to "Licencia" Talalmanyokat Ertekesito Vallalat, Budapest, Hungary

Filed Oct. 28, 1975, Ser. No. 626,131
Claims priority, application Hungary, Oct. 30, 1974, MA 2611
Int. Cl.² H05B 3/00
U.S. Cl. 219—71 **9 Claims**



1. A process for the resistance heating of electrically conductive workpieces, comprising establishing a solid support surface for a liquid, flowing a molten electrically-conductive material over said support surface with linear flow, maintaining a said workpiece in an undeformed condition in contact with said molten material flowing over said support surface with linear flow, and passing an electric current through said workpiece between said molten material and another electrical contact.

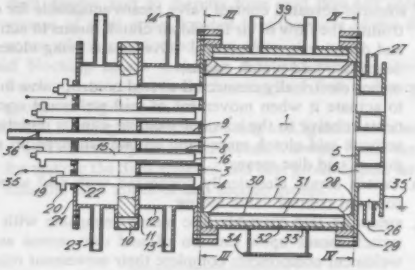
4,056,704

PROCESS AND APPARATUS FOR HEATING GASES

Anthony John Beach, New Waltham; Geoffrey Frank Eveson, Tetney, and Reginald Keith Leedham, Grimsby, all of England, assignors to Laporte Industries Limited, England

Filed May 21, 1975, Ser. No. 579,635
Claims priority, application United Kingdom, June 4, 1974, 26413/74
Int. Cl.² B23K 9/00
U.S. Cl. 219—121 P **22 Claims**

1. Apparatus for heating gas comprising means defining a heating zone; gas supply means for applying gas to said heating zone to be heated therein; gas removal means for removing heated gas from said heating zone; upstream and downstream electrode means adapted to establish a distributed electrical discharge in said heating zone; and means for establishing a difference in electrical potential between said upstream and downstream electrical means, said gas supply means comprising a plurality of adjacently positioned conduits arranged to constrain the gas supplied to said heating zone at its point of entry thereto into a plurality of substantially parallel streams; and the upstream electrode means comprising a plurality of



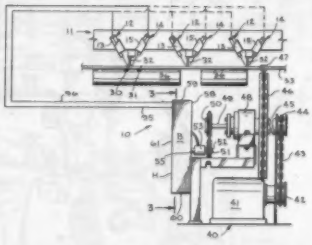
electrode members positioned respectively in said plurality of gas streams.

4,056,705

APPARATUS FOR CONTROLLING THE WELDING PATTERN BETWEEN WELDMENT COMPONENTS

Richard L. Linam, League City, Tex., and Leonard J. Lucas, Richmond, Calif., assignors to Kelso, Inc., Galveston, Tex.

Filed Mar. 15, 1976, Ser. No. 666,932
Int. Cl.² B23K 9/00
U.S. Cl. 219—125 R **3 Claims**



1. An arrangement for selectively actuating longitudinally spaced rows of welding guns to weld weldment components in a predetermined welding pattern, the weldment components being movable relative to the rows of welding guns comprising:

a. disc means supported on a shaft and rotatable from an initial predetermined position in synchronism at a predetermined reduced speed in relation to the speed of the movable weldment components;

b. circumferential surface indicating means on said disc means corresponding with the weld pattern to be formed on the weldment components;

c. optical scanner means electrically connected to each row of the welding guns and responsive to said surface indicating means to sequentially activate and deactivate the rows of welding guns to form the weld pattern on the weldment components;

d. said scanner means being longitudinally spaced from each other by the following formula:

$$\frac{\text{speed of weldment components}}{\text{peripheral surface speed of disc means}} = \frac{\text{length of space between rows of welding guns}}{\text{length of space between scanner means}}$$

e. air clutch means operable when activated to engage said disc means for rotation in synchronism relative to the

movement of the weldment components and operable when deactivated to disengage said disc means from rotation in synchronism relative to the movement of the weldment components;

f. solenoid actuated control valve means actuatable for controlling the flow of air to said air clutch means to activate and deactive it, said control valve means being closed to deactivate said clutch means;

g. means electrically connected to said control valve means to actuate it when movement of said weldment components relative to the rows of welding guns is initiated to activate said clutch means and initiate synchronous rotation of said disc means;

h. switch means electrically connected with said solenoid actuated control valve means;

i. means on said rotatable disc means engagable with said switch means upon rotation of said disc means as the weldment components complete their movement relative to the rows of welding guns to actuate said control valve means and thereby deactivate said clutch means; and

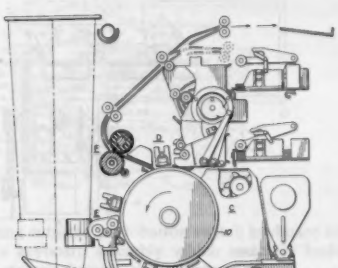
j. means to rotatably return said disc means to its initial predetermined position.

4,056,706

APPARATUS AND METHOD FOR EXTENDING FUSER RELEASE LIFE

Stephen Strella, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 21, 1975, Ser. No. 569,735
Int. Cl.[2] H05B *1/00;* **G03G** *15/00*
U.S. Cl. 219—216 **12 Claims**



1. A fusing assembly for use in a xerographic reproducing apparatus for fixing a powder image onto a support surface comprising,

a frame;

a first and second member journaled in parallel relation to a third member in said frame, the third member being a fuser member comprising an elastomer impregnated with an offset prevention fluid, the first member being a pressure member to cause the support surface to advance between the fuser member and the pressure member, and the second member being an offset prevention liquid supply member comprising an elastomer material capable of degrading to a fluid having offset prevention properties and providing upon its surface an offset prevention fluid for transfer to the fuser member for restoration of depleted offset prevention fluid in the fuser member; and

means to heat at least the surface of the fuser member;

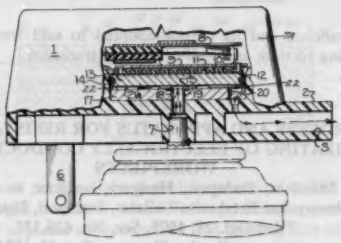
the fuser member being heated sufficiently and contacting the support surface carrying the powder image with sufficient pressure whereby the powder image is fused to the support surface as the support surface advances between the pressure member and the fuser member, the second member contacting the fuser member with sufficient pressure whereby the offset prevention fluid therein transfers from the elastomer material of the second member to the elastomer material of the fuser member and thereby replenishes release material depleted from the fuser member.

4,056,707

ELECTRICAL HEATING DEVICE FOR USE WITH AEROSOL CONTAINERS

Franklin C. Farnam, 19 Glenview Road, Asheville, N.C. 28804

Filed Oct. 6, 1975, Ser. No. 619,599
The portion of the term of this patent subsequent to Aug. 31, 1990, has been disclaimed.
Int. Cl.[2] H05B *1/02;* **B67D** *5/62;* **F24H** *1/12*
U.S. Cl. 219—302 **6 Claims**



1. Apparatus for heating fluid dispensed from a container and comprising:

housing means for passing fluid being dispensed and having an entrance orifice adapted to receive an outlet nozzle of a container, an exit orifice for delivering heated fluid and conduit means establishing operative

fluid heating means in said housing means for heating fluid passing therethrough and having heat sink means for storing heat and disposed in heat transfer relation to said conduit means for heating lather therein and electrical heating means for heating said heat sink means, and

electrical connector means on said housing and electrically connected to said electrical heating means for conducting electrical current thereto,

said connector means and said entrance orifice being so disposed one relative to the other that connection of said connector means with a source of electrical current prevents said entrance orifice from receiving an outlet nozzle of a container and receipt of an outlet nozzle of a container by said entrance orifice prevents said connector means from connecting with a source of electrical current,

said heat sink means having a thermal capacity capable of storing during conductance of electrical current through said electrical heating means thermal energy sufficient to heat a charge of fluid to a desired temperature after conductance of electrical current has been interrupted by disconnecting of said connector means.

4,056,708

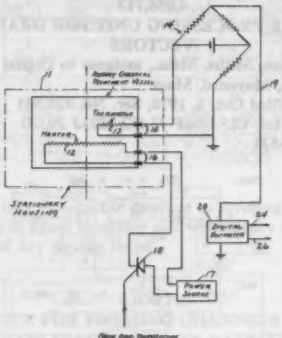
DIGITAL TEMPERATURE CONTROLLER

Charles Soodak, Silver Spring, and Alexander Gelbman, Gaithersburg, both of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed July 22, 1975, Ser. No. 598,037
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—499 **6 Claims**

1. A chemical treatment apparatus including temperature control means comprising heater means, an electrical power source, circuit means including a relay device connecting said power source to said heater means, temperature sensing means including a temperature sensor in the apparatus generating a signal corresponding to actual temperature, temperature command means furnishing a command signal corresponding to a desired temperature, programmable computer means con-

nected between the sensing means and the command means generating a control signal which is a programmed function of the difference between the desired temperature and the actual temperature, means operating said relay device in accordance with said control signal to control the supply of power to said heater means and modulate the supply in accordance with said programmed function, temperature indicating means connected to said sensing means, said indicating means having means to provide an output signal corresponding to said actual temperature, wherein said computer means is connected be-



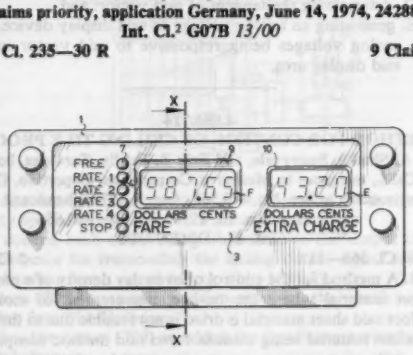
tween the output of said indicating means and said command means, wherein said temperature indicating means comprises a digital voltmeter and said output signal is in binary form, the command signal being likewise in binary form, and wherein said digital voltmeter includes terminal means to supply the binary actual temperature output signals and means to supply additional signals representing abnormal system conditions, and means to inhibit operation of said relay device responsive to the presence of any of said additional signals or to the absence of actual temperature output signals.

4,056,709

TAXIMETER INDICATOR ARRANGEMENT

Hans-Peter Scholl, Villingen-Schwenningen; Alfons Heimburger, Niedereschach; Ulrich Warkentin, Tannheim, and Manfred Säufferer, Villingen, all of Germany, assignors to Kienzle Apparate GmbH, Villingen-Schwenningen, Germany

Filed June 13, 1975, Ser. No. 587,235
Claims priority, application Germany, June 14, 1974, 2428887
Int. Cl.[2] G07B *13/00*
U.S. Cl. 235—30 R **9 Claims**



1. In a digital taximeter of the type operative for providing a visual read out of at least a first and a second multi-digit number, in combination,

a single multi-digit illuminated-digit display unit having a row of equal-size digit zones and including a first group of digit zones and a second group of digit zones respectively adapted for the display of the first and second multi-digit numbers;

blocking means for blocking from view at least one of the middle digit zones of said single multidigit illuminated-digit display unit to thereby form said first and second groups of digit zones located to either side of the digit zones which are blocked from view,

said blocking means including first and second viewing frame means respectively framing said first and second groups of digit zones,

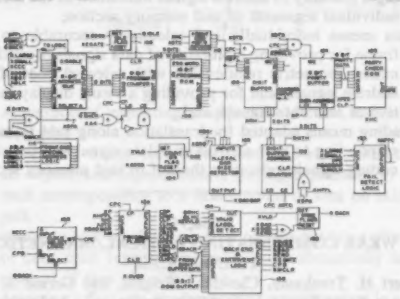
said first viewing frame means being configured and dimensioned differently from said second viewing frame means for making the digit zones of said first group appear larger than the digit zones of said second group.

4,056,710

SYSTEM FOR DECODING BAR CODE

Robert C. Shepardson, Cupertino, and Michael E. Watts, Woodside, both of Calif., assignors to Coherent Radiation, Palo Alto, Calif.

Filed Apr. 16, 1976, Ser. No. 677,715
Int. Cl.[2] G06K *7/08*; G06F *15/34*
U.S. Cl. 235—437 **3 Claims**



1. A reader-scanner system for detecting and decoding coded character information where each encoded character comprises a plurality of bars of alternating light reflective characteristics of one or more widths comprising:

a. a light source for projecting a beam of light;

b. a scan target area through which pass encoded objects to be scanned;

c. a light-sensitive detector for detecting changes in the level of light reflected from objects at said scan target area which are scanned by said beam of light;

d. means responsive to said detector for determining possible bar width and bar characteristic information of the object being scanned;

f. means responsive to said bar width information to determine in real time valid sequences of said information comprising;

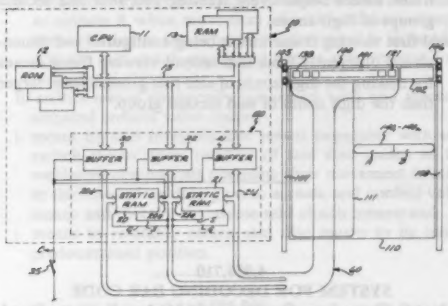
multiple level decision making means which includes means for comparing incoming bar width and characteristic information with allowable bar width and characteristic values for the bar and characteristic information sequence developed to that point,

means for failing any information sequence which is not allowable, and means for moving to the next and subsequent levels of the decision-making sequence so long as the information sequence is an allowable one, until the completion of the multi-level sequence at which time an individual character is uniquely defined.

4,056,711
METHOD AND APPARATUS FOR PROGRAMMING MICROPROCESSORS

William Paul Lamar, 1024 17th St., Hermosa Beach, Calif. 90254

Filed Oct. 24, 1975, Ser. No. 625,673
Int. Cl.² G06K 7/10, 19/06
U.S. Cl. 364—200 7 Claims

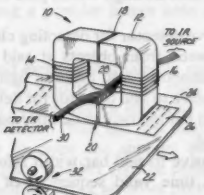


1. Apparatus for loading a sequence of instructions into a memory section of a data processing device comprising:
a frame;
address means selectively securable to said frame for providing a plurality of address signals indicative of the selected individual segments of said memory section;
data means individually and selectively securable to said frame for providing a plurality of data signals in predetermined geometric relationship with selected ones of said address signals, and for providing a visual display indicative of said data signals; and
reading means adapted for translation along said frame for responding to said address and data signal and providing coding signals indicative thereof to said memory section.

4,056,712
WEAR COMPENSATING OPTICAL/MAGNETIC TRANSDUCER

Robert H. Trenkamp, Cleveland Heights, and Gerald A. Dissauer, South Euclid, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 9, 1976, Ser. No. 694,384
Int. Cl.² G11B 5/25; G06K 7/01
U.S. Cl. 235—440 10 Claims

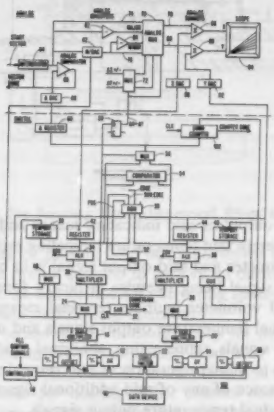


1. A transducer for reading optical and magnetic data from a document in operative sliding engagement therewith, said transducer comprising:
a magnetic read head comprising a core of magnetic material having a contact surface adapted to slidably engage documents during reading and a magnetic reluctance aperture disposed in the area of said contact surface, and
optical means for delivering and receiving radiant energy to and from documents as they are read, said optical means comprising a plurality of optical fibers each with an end portion of uniform cross-sectional area extending through said reluctance aperture to an end, the ends of said optical fibers providing an optical sensing surface defining a reading aperture of predetermined size substantially coplanar with said contact surface and adapted to engage documents during reading whereby said reading aperture remains substantially coplanar with said contact surface and the size of said aperture remains substantially constant with wear.

4,056,713
DISPLAY PROCESSING UNIT FOR DRAWING VECTORS

Robert J. Quinn, Millis, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 1, 1976, Ser. No. 728,801
Int. Cl.² G06F 15/20; H01J 29/70
U.S. Cl. 364—521 16 Claims



7. The process of displaying a vector on a display device, said process comprising the steps of:
A. identifying the location of said vector with respect to the display area;
B. determining the rectangular coordinates of said vector which are within said display area;
C. comparing said rectangular coordinates of said vector to determine which is larger;
D. determining the tangent of said vector; and
E. generating an analog voltage to said display device, said analog voltages being responsive to said vector within said display area.

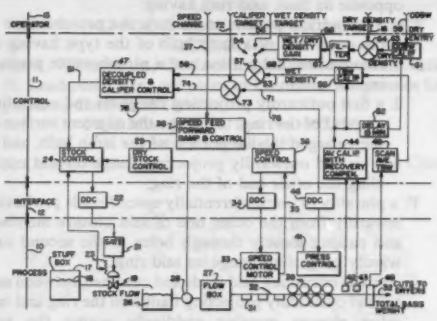
4,056,714
METHOD FOR CONTROL OF CEILING TILE PROCESS

Al Al-Shaikh, Sunnyvale, and Erik B. Dahlin, Saratoga, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 495,565, Aug. 8, 1974, abandoned. This application Jan. 13, 1976, Ser. No. 648,656
Int. Cl.² D21F 11/00
U.S. Cl. 364—111 2 Claims

1. A method for the control of oven dry density of a moving sheet material where the on-line measurement of moisture before said sheet material is dried is not feasible due to the type of sheet material being manufactured said method comprising the following steps: measuring the total basis weight of said material; measuring the thickness of said material, the ratio of basis weight and thickness providing the wet density of said material; utilizing said wet density in a feedback control loop to control such density to a target; obtaining a sample of wet material; drying such sample in a manner equivalent to the oven drying of said sheet material, obtaining the oven dry

density of said material by division with a thickness measurement taken substantially at the time said sample was obtained; compared said oven dry density of said sample with a predetermined dry density target to produce an error signal; and utilizing said error signal to update said wet density in a manner to achieve said dry density target.

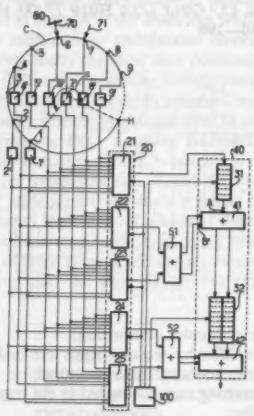


4,056,715

DEVICE FOR FORMING CHANNELS USING DETECTORS SPACED OUT ON A CIRCULAR BASE

Guy Parent, Le Plessis Robinson, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 2, 1975, Ser. No. 636,888
Claims priority, application France, Dec. 10, 1974, 74.40458
Int. Cl.² G01S *3/00*
U.S. Cl. 364—514 **18 Claims**



1. Device for forming channels comprising H detectors evenly spaced along an arc of a circular base:

H coders, each coder being connected to the output of a detector for transcoding the analog output signal of the detector into a signal having s bits ($s \geq 1$),

Means (200) for sampling and memorizing the signals coming from the H coders,

A bus bar system (300) on which the signals memorized as a whole pass,

Means (400) for sampling at the frequency F_H the signals on the bus bar system (300),

Control means (500) for the sampling means (400),

(N−1) secondary adders (51, 52), the inputs of which are fed by the sampling means (400),

A chain (40) constituted by an alternate sequence of (N−1) delay devices (31, 32) and of (N−1) main adders (41, 42), where $(2N-1 < H)$, each main adder (41, 42) comprising an input (A) connected to the output of a delay device (31, 32) and a lateral input (B) connected to the output of a secondary adder (51, 52), each delay device (31, 32) comprising at least an elementary cell, the chain input being fed by said sampling means (400), and

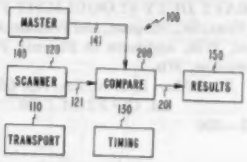
A clock (100) delivering a frequency F_H to the control means and to the chain (40) for controlling the transfer of the signals along the chain (40) so that the signals stay only during a period $1/F_H$ in an elementary cell.

4,056,716

DEFECT INSPECTION OF OBJECTS SUCH AS ELECTRONIC CIRCUITS

Duane Willard Baxter, Rochester, Minn., and Richard Edward Shipway, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,337
Int. Cl.² H04N *1/38*
U.S. Cl. 364—515 **8 Claims**



1. A method of inspecting an object for defects, comprising the steps of:

a. producing a high-resolution electronic representation of an object, said representation having a plurality of cells each corresponding to a first amount of area on said object;

b. storing a low-resolution master pattern having a plurality of cells each representing a second, substantially larger amount of area on said object;

c. detecting a first of a predetermined set of features in a first window comprising a plurality of said cells of said high-resolution representation;

d. detecting a second feature of said set in a second window comprising a plurality of said cells of said low-resolution master pattern, said second window representing a substantially larger total area on said object than the area represented by said first window;

e. comparing said first feature with said second feature; and

f. repeating steps (c), (d) and (e) for different ones of said windows, representing further areas on said object.

4,056,717

TEMPERATURE CORRECTION SYSTEMS FOR A FLUID FLOW METER

Malcolm W. Cornforth, Edgewater Park, N.J., assignor to The Singer Company, New York, N.Y.

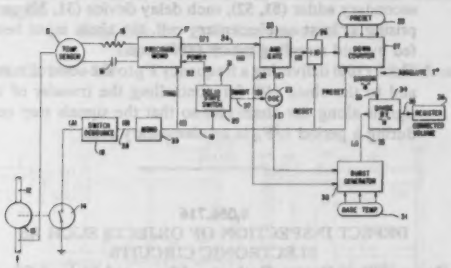
Filed Oct. 27, 1976, Ser. No. 735,861
Int. Cl.² G01F *1/08, 15/02*
U.S. Cl. 364—510 **10 Claims**

1. In a system for correcting the measurement of the volume flow of a fluid to a standard volume flow in response to a variable physical condition of said fluid, the combination comprising:

means providing a single pulse signal for each uncorrected unit volume flow,

power demanding means initiated by said pulse signal and

responsive to said variable condition for calculating the volume flow corrected to a standard volume flow, and



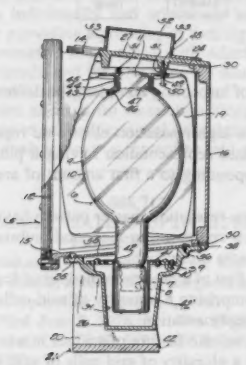
means for substantially reducing the power demand of said system by controlling the duty cycle of the supply of power to at least part of said calculating means.

4,056,718

HEAVY DUTY FLOODLIGHT FIXTURE

Kenneth R. Faux, Sr., Mequon, and William A. Wenman, both of Milwaukee, Wis., assignors to Phoenix Products Company, Inc., Milwaukee, Wis.

Filed Mar. 8, 1976, Ser. No. 664,914
Int. Cl.[2] F21M *3/00*
U.S. Cl. 362—306 **1 Claim**



1. A floodlight fixture of the type having a housing with a transparent front wall, rigid top and bottom walls which have aligned holes through either of which access may be had to the interior of the housing, and a reflector facing the transparent wall, a closure member detachably secured to each of said rigid top and bottom walls over the hole therein, and a lamp socket on one of said closure members to receive the base of a lamp, said fixture being characterized by an improved shock resistant mounting for its lamp comprising the combination of:

A. means on said one of the closure members forming a socket-receiving cavity which opens to the interior of the housing and has a ledge at the mouth thereof;

B. an annular diaphragm of resiliently yieldable material having its peripheral portion seated on and secured to said ledge;

C. a substantially rigid carrier embracing the lamp socket, said carrier having a closed end to which the socket is attached and an open end provided with mounting flange means;

D. means securing said mounting flange means to the inner edge portion of the annular diaphragm, with the carrier and the socket attached thereto located in said cavity and spaced from the walls thereof so as to be free to move to the extent the resiliency of the diaphragm permits such motion;

E. a ring of a size to embrace the end portion of a lamp opposite its base, said ring having

1. a cylindrical portion to encircle the protuberance at the outer end of a lamp bulb of the type having an enlarged medial portion and a protuberance projecting therefrom,
2. a first outwardly projecting flange on and encircling one end of the ring, to engage the adjacent surface of the enlarged medial portion of the lamp bulb, and
3. a second outwardly projecting flange on and encircling the other end of the ring;

F. a plurality of circumferentially spaced studs projecting inwardly from the other one of said closure members and passing loosely through holes in the second outwardly projecting flange on said ring;

G. springs encircling said studs and confined between said second outwardly projecting flange on the ring and said other closure member yieldingly urging the ring towards said annular diaphragm, so that said springs and the resilient yieldability of the diaphragm coact to floatingly hold the lamp and isolate the same from shocks to which the fixture may be subjected; and

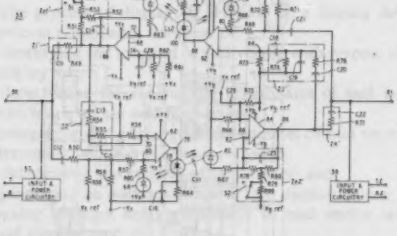
H. abutments on the studs to limit spring produced movement of the ring when such movement is not limited by the presence of a lamp.

4,056,719

TWO-WAY TELEPHONE TRANSMISSION SYSTEM UTILIZING OPTO-COUPLERS

Sigurd Gunther Waaben, Princeton, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 548,404, Feb. 10, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,562
Int. Cl.[2] G01J *1/32*; H03F *17/00*; H04B *9/00*
U.S. Cl. 250—199 **11 Claims**



7. An opto-coupler comprising:

a first amplifier having an output terminal, at least one input terminal, and a reference terminal;

a light emitting means coupled to the output terminal of the amplifier;

first and second light detecting means, the first and second light detecting means being positioned so as to receive light from the light emitting means;

the first and second light detecting means being characterized in that thhe current induced therethrough is proportional to the light incident thereon;

the first light detecting means being coupled to the input terminal of the first amplifier;

a second amplifier having at least two input terminals and one output terminal and being characterized in that when signals of equal magnitude and the same polarity appear at the two input terminals they cancel each other and there is essentially no output signal;

the signal light detecting means being coupled to the first of the two input terminals of the second amplifier; and

capacitive coupling means having a first terminal coupled to the second input terminal of the second amplifier and

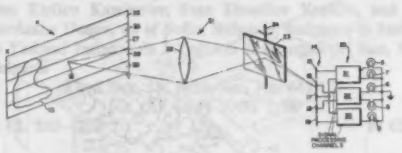
having a second terminal coupled to the reference terminal of the first amplifier.

4,056,720

SCANNING POINT SOURCE OPTICAL ENERGY DETECTOR

Louis A. Williams, Jr., Cincinnati, Ohio, and Joseph D. Miller, N. Lauderdale, Fla., assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Mar. 8, 1976, Ser. No. 665,156
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—203 R **15 Claims**



1. Apparatus for indicating that a point source optical radiation emitter exists in a relatively large field of view, said indication being substantially independent of large, non-point source targets in the field of view, comprising first and second point source detectors for generating output currents in response to said radiation irradiating them, means for scanning the fields of view of the detectors so that the field of view of each detector traces a substantially straight line path across the large field of view, said detectors having slightly displaced fields of view in a direction at right angles to the direction of scan, the spacing of the detectors and the paths traced by the detectors being substantially parallel and close enough to each other to enable the images of large targets to be indicated as undulations having approximately the same wave shape at substantially the same time positions at outputs of the detectors while images of point sources are indicated as undulations having different wave shapes at substantially the same time positions at outputs of the detectors, a differential amplifier having complementary input terminals and at least one output terminal, said first and second detectors being respectively connected to said complementary input terminals, D.C. negative feedback paths between the input and output terminals, whereby in response to a point source target irradiating one of said detectors there is derived at one of said output terminals a signal including a pulse having a polarity indicative of which of the detectors is irradiated by the point source target, said signal being substantially independent of large targets, and means responsive to the signal for indicating that the pulse is derived from a point source.

4,056,721

AUTOMATIC RETICLE BRIGHTNESS CONTROL CIRCUIT MEANS IN NIGHT VISION IMAGE INTENSIFIERS

Sen-te Chow, Alexandria, and Earl M. Thomas, Arlington, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 9, 1976, Ser. No. 721,750
Int. Cl.[2] H01J *31/50*; G01J *1/32*
U.S. Cl. 250—213 VT **4 Claims**

1. An automatic reticle brightness control circuit means for maintaining the brightness of a reticle commensurate with the brightness of an object image incident upon the cathode of an image intensifier tube under varying input light conditions, the means comprising:

a screen power supply oscillator and voltage multiplier for providing a direct current bias voltage on the screen of said image intensifier tube;

a screen current sensing circuit having on one side thereof a common node connected to the secondary winding of said screen power supply oscillator and having another side connected to a ground potential;

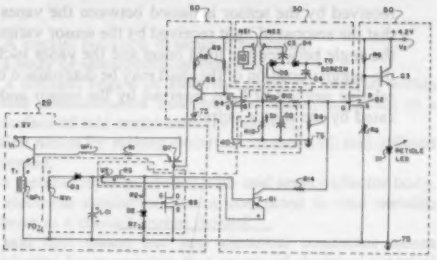
an automatic brightness control circuit having an input connected to said common node and an output therefrom;

an n-p-n transistor base controlled MCP OSC circuit for providing a variable feedback direct current voltage at a feedback terminal in response to a signal from the output of said automatic brightness control circuit applied to the base of said n-p-n transistor;

a feedback circuit having an input connected to said variable feedback direct current voltage at said feedback terminal and an output therefrom providing a voltage in direct relation to the value of said variable feedback direct current voltage;

a reticle LED direct current voltage source for providing bias voltage to a reticle LED; and

a reticle brightness control circuit, said reticle brightness control circuit having two common inputs and an output therefrom for controlling the bias voltage to said reticle LED wherein a first of said common inputs is connected



to said common node of said screen current sensing circuit and a second of said common inputs is connected to the output of said feedback circuit whereby as screen current varies proportionally to the object image input light and said screen current flows through said current sensing circuit the voltage at said common node decreases as screen current increases and causes the first of said common inputs to said reticle brightness control circuit to vary the bias voltage across said reticle LED directly with the increase in screen current and whereby as the screen current further increases past an automatic brightness control level said automatic brightness control circuit base controls said n-p-n transistor base controlled MCP OSC circuit to change said variable feedback direct current voltage inversely with increasing screen current in which said variable feedback direct current voltage source controls said second of said common inputs to said reticle brightness control circuit for additionally increasing current flow through said reticle LED directly with increasing screen current to keep the reticle visible to an observer under varying light conditions of said object image.

4,056,722

SHAFT POSITION SENSOR

Earnest Joseph Ray, Mountain View, Calif., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Sept. 29, 1976, Ser. No. 727,870
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 SE **8 Claims**

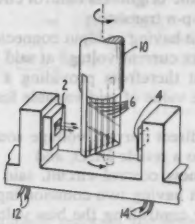
1. Shaft position sensing apparatus comprising

a group of generally parallel vanes with each said vane extending in a direction generally longitudinally of said shaft axis and said group arranged in a pattern extending transversely of said shaft axis;

vane mounting means for maintaining said group of vanes in said relationships with one another and with said shaft, said vane mounting means being attached to said shaft for rotation with said shaft;

a light surce positioned on one side of said shaft and having a beam of light directed transversely of said shaft axis against said vanes at a point adjacent said shaft axis; and

a light sensor aligned with said light beam and positioned on the opposite side of said shaft axis from said light source for receiving light from said light beam, whereby light



received by the sensor is passed between the vanes such that the amount of light received by the sensor varies with the angle between the light beam and the vanes such that the angular position of the shaft may be determined by the relative amount of light received by the sensor and indicated by the sensor output.

4,056,723

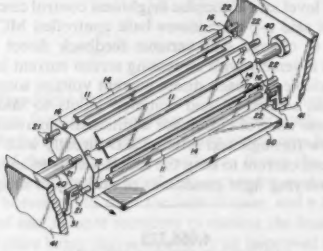
ROTATABLE CORONA DEVICE

Brian E. Springett, and Dror Sarid, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 23, 1976, Ser. No. 651,768

Int. Cl.² H01T *19/00*

U.S. Cl. 250—324 **5 Claims**



1. A corona charging arrangement for depositing charge on an imaging surface comprising:

a plurality of corona discharge devices carried by a common member, each device comprising a corona electrode including a wire coated with a thick dielectric material sufficient to prevent the flow of conduction current therethrough, conductive biasing member carried by said common member, said electrode supported in contact with said biasing member, means for applying corona causing potentials to one of said devices, and

means for moving said member to orient one of said plurality of devices for depositing charge on said surface.

4,056,724

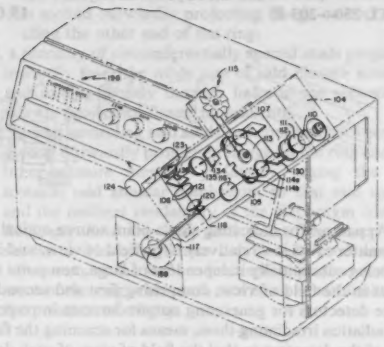
FLUOROMETRIC SYSTEM, METHOD AND TEST ARTICLE

Richard A. Harte, Redwood City, Calif., assignor to International Diagnostic Technology, Santa Clara, Calif.

Continuation-in-part of Ser. No. 447,574, March 4, 1974, abandoned, and a continuation-in-part of Ser. No. 553,582, Feb. 27, 1975, Pat. No. 3,992,631. This application July 8, 1976, Ser. No. 703,579

Int. Cl.² G01T *1/00*; G01N *31/00*

U.S. Cl. 250—328 **10 Claims**



1. In apparatus for analyzing a sample by fluorometric techniques, a carrier member having a surface portion adapted for receiving said sample and including means for supporting said sample thereon as an exposed layer presenting a surface for analysis,

test stage means for supporting said member at an analysis location in said apparatus, said carrier member and said stage means being constructed and arranged so that said member is removably insertable into said stage means,

illumination means including a source of excitation radiation and means forming a first optical system intersecting said analysis location for delivering said radiation to the surface thereat,

optical fluorescence collection means including a photodetector and means forming a second optical system intersecting said analysis location for receiving the fluorescence emitted from the exposed layer thereat,

emission filter means associated with said fluorescence collection means for restricting the sensitivity thereof to a frequency band overlapping the emission spectra of said fluorometrically active substance and being substantially non-responsive to the band of excitation radiation,

means juxtaposed with said excitation filter means for forming a beam splitter for removing a portion of the light therefrom for developing a reference channel in parallel with the illumination means,

means for alternating said illumination means and said reference means during mutually exclusive periods of time,

sensing means for developing a signal indicative of sample illumination on-times when said photodetector is activated by sample fluorescence and for developing a second signal indicative of the period when said reference means is detected,

a demultiplexer response to said signal for alternately delivering outputs indicative of said sample signal or said reference signal,

a sample signal processor fur receiving said sample signal,

a reference signal processor for receiving said reference signal,

said processors serving to develop signal outputs, the strength of which is proportional to the amount of light signal received at said photodetector during said sample and reference periods, respectively,

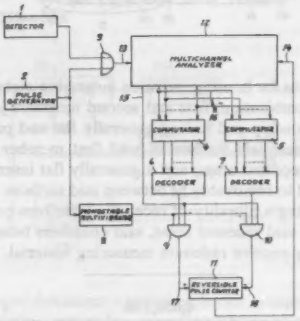
a ratio circuit for obtaining the ratio S/R where S equals sample signal and R equals said reference signal, and display means responsive to said ratio circuit for displaying the value of said ratio.

4,056,725

METHOD OF AND SYSTEM FOR COMPENSATING THE DISTORTION OF AMPLITUDE SPECTRA OF MULTICHANNEL ANALYZERS IN SPECTROMETRY

Hristo Kirilov Kamburov; Ivan Danailov Vankov, and Ivan Yordanov Donev, all of Sofia, Bulgaria, assignors to Institute za Yadreni Izsledvania I Yadrena Energetika pri Ban, Sofia, Bulgaria

Filed Dec. 16, 1975, Ser. No. 641,179
Int. Cl.² G01T *1/00, 3/00*
U.S. Cl. 250—336 **10 Claims**



6. A system for compensating pulse-amplitude distortion in a spectrometric operation in which a pulse due to particle emission from a sample is converted into a digital signal identifying one of a multiplicity of channels corresponding to a respective pulse amplitude, comprising:

detector means for generating measuring pulses in response to the flow of particles from a sample to be measured;

a generator of reference pulses of predetermined frequency and amplitude;

a multichannel analyzer converting the amplitudes of incoming pulses into digital codes identifying a multiplicity of channels, said analyzer having a pulse-receiving input and a set of stage outputs carrying said digital codes, said detector means and said generator having outputs connected to said pulse-receiving input;

a first decoder connected to certain of said stage outputs for emitting a first counting pulse in response to a pulse amplitude in said pulse-receiving input falling within a predetermined first group of said channels encompassing the amplitude of said reference pulses;

a second decoder connected to other of said stage outputs for emitting a second counting pulse in response to a pulse amplitude in said pulse-receiving input falling within a predetermined second group of said channels adjoining said first group;

a reversible pulse counter having a forward-stepping input connected to said first decoder and a backward-stepping input connected to said second decoder for respectively receiving said first and second counting pulses therefrom; and

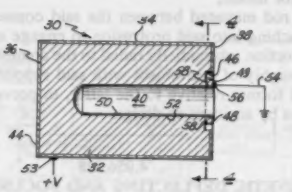
gating means controlled by said generator and interposed between said decoders and said pulse counter for allowing the transmission of a counting pulse only within a limited period following the generation of any reference pulse.

4,056,726

COAXIAL GAMMA RAY DETECTOR AND METHOD THEREFOR

Micha Harchol, Kendall Park, N.J., assignor to Princeton Gamma-Tech, Inc., Princeton, N.J.

Filed Oct. 1, 1975, Ser. No. 618,357
Int. Cl.² G01T *1/24*; H01L *29/06*
U.S. Cl. 250—370 **43 Claims**



1. A coaxial radiation detector comprising:

a. a body of semiconductor material,

b. a diffused region of electrical impurity material within said semiconductor material, said region extending to a surface of said semiconductor material,

c. first means for making electrical contact with said diffused region,

d. a metallic layer in contact with said semiconductor body,

e. electrical conductor means connected to said metallic layer at a contact region thereof,

f. said first means and said electrical conductor means adapted for connection to a source of electrical potential for forming a depletion zone within said semiconductor material, and

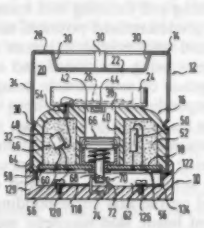
g. means for isolating said contact region from said depletion zone.

4,056,727

ATTACHMENT MEANS OF AN OBJECT TO A SUPPORT

Hartwig Beyersdorf, Scharbeutz, Germany, assignor to GEBA, Gesellschaft fuer Brandmeldeanlagen mbH & Co., Neuss, Germany

Filed Sept. 3, 1976, Ser. No. 720,421
Claims priority, application Germany, Sept. 5, 1975, 2539655; Sept. 5, 1975, 281764
Int. Cl.² G01T *1/18*
U.S. Cl. 250—385 **43 Claims**



1. A shock-, vibrations-, and tampering-proof attachment means of an object, such as a signal producing insert of an ionization alarm system coaxially along a common central axis to a fixed support face of a support, such as of land-, marine- and air-vehicles,

A. said object comprising:

A 1. an elongated protrusion mounted non-rotatably and coaxially in the bottom of said object and protruding through its bottom downwardly facing said support face;

A 2. a spring assembly mounted coaxially within the bottom of said object;

A 3. a helical crescent shaped channel with openings

within the protruding bottom of said protrusion said channel continuing with a vertex directed upwardly and from there to its end;

B. said support provided with a connector means for a rod, said connector means fixed non-rotatably coaxially with said protrusion; said connector means protruding upwardly from said support

A 4. said protrusion mounted with said spring assembly under upward axial tension away from the said connector means;

C. a rod mounted between the said connector means and reaching into said protrusion to engage said channel in a direction substantially radial to the common axis to permit assembly of said object with said support by rotation of the former relative to the latter, to prevent their separation by accident or design.

4,056,728

MAGNETIC DEFLECTING AND FOCUSING DEVICE FOR A CHARGED PARTICLE BEAM

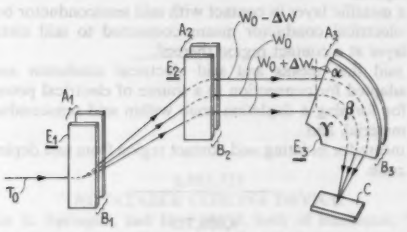
Hubert LeBoutet, Paris, France, assignor to C.G.R.-Mev., France

Continuation of Ser. No. 326,957, Jan. 26, 1974, abandoned. This application June 19, 1974, Ser. No. 481,117

Claims priority, application France, Jan. 31, 1972, 72.03136

Int. Cl.² H01J *3/14*

U.S. Cl. 250—396 R **5 Claims**



1. A magnetic deflecting and focusing device for a beam of accelerated charged particles having an incident mean path T_o comprising, in combination, magnetic means for translating said beam in a direction perpendicular to said incident mean path T_o to obtain a translated beam parallel to said incident mean path T_o, the particle paths of said translated beam being dependent upon the momentum of said particles, and magnetic means for deflecting and focusing said translated beam upon a target having a predetermined position, said magnetic means for translating and said magnetic means for deflecting and focusing said beam being positioned and configured so as to achieve convergence of said particle beam on said target in two mutually perpendicular planes whose intersection is coincidental with the mean path of said beam emerging from said device, the positioning and configuration of said magnetic means further being such that momentum convergence of said particle beam is simultaneously achieved on said target substantially located on the axis corresponding to the mean path T_o of the incident beam; said magnetic means for translating said beam comprising a first and a second electromagnet having respectively an entry iace and an exit face parallel to one another; the entry face A_1 of said first electromagnet being perpendicular to said incident mean path T_o and the exit face B_2 of said second electromagnet being perpendicular to said particle beam emerging from said second electromagnet; the entry face A_2 of said second electromagnet being parallel to the exit face B_1 of said first electromagnet and said faces A_2 and B_1 being spaced of an interval of:

$$d = 2r/tg\ \theta$$

the normal to said beam at the exit face B_1 and at the entry face A_2 being respectively at an angle θ with said entry face A_1 and said exit face B_2 and r being the radius of curvature of said particle beam within said first and second electromagnet.

4,056,729

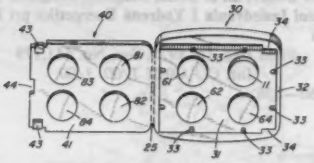
APPARATUS FOR HOUSING RADIATION MEASURING MATERIAL HOUSED IN A PLASTIC INSERT

Carl Collica, New Rochelle; Leonard Epifano, Rye, and Ralph Farella, Scarsdale, all of N.Y., assignors to Medi-Ray, Inc., Tuckahoe, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,337

Int. Cl.² G01T *1/04*

U.S. Cl. 250—472 **9 Claims**



1. Apparatus for housing radiation measuring material, comprising, in combination, first and second members joinable in spaced relationship and having generally flat and parallel opposing surfaces; said surface of said first member having a plurality of recessed areas; and a generally flat insert member proportioned to removably fit between said surfaces said insert member having a plurality of receiving chambers positionally aligned with said recessed areas, said chambers being adapted to removably receive radiation measuring material.

4,056,730

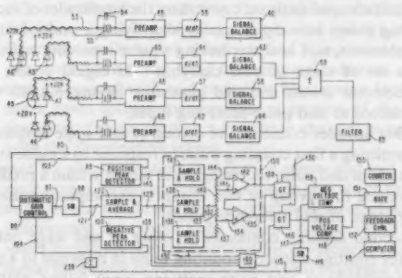
APPARATUS FOR DETECTING REGISTRATION MARKS ON A TARGET SUCH AS A SEMICONDUCTOR WAFER

Donald E. Davis, Wappingers Falls, N.Y.; Millard A. Habegger, Boulder, Colo., and Hannon S. Yourke, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 704,605, July 12, 1976, abandoned. This application Oct. 12, 1976, Ser. No. 731,270

Int. Cl.² H01J *37/00*

U.S. Cl. 250—492 R **7 Claims**



7. In apparatus for detecting the location of an electron beam with respect to registration marks on a wafer, said apparatus including: means for causing an electron beam to scan said registration marks, detecting means for detecting electrons scattered by said registration marks and for producing a first signal related to the time varying density of scattered electrons impinging on the detecting means, and analyzing means for analyzing data to provide an indication of said location; the improvement comprising:

differentiating means having an output and being responsive to said detecting means for producing a second signal at

said output representing the time derivative of said first signal;

said output being connected to said analyzing means to provide said second signal as data to said analyzing means.

4,056,731

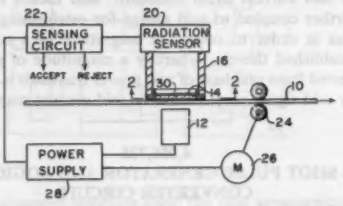
RETICLE PROTECTIVE STRUCTURE AND RADIATION SENSITIVE VALIDATION APPARATUS

Jack E. Bayha, Adrian, Mich., assignor to ARDAC/USA, Chesterland, Ohio

Continuation of Ser. No. 413,428, Nov. 7, 1973, which is a continuation of Ser. No. 159,917, July 6, 1971, abandoned. This application Dec. 1, 1975, Ser. No. 636,719

Int. Cl.[2] G06K 5/00, 11/00

U.S. Cl. 250—556 4 Claims



1. A paper document validating device comprising,

a. a radiation source for projecting a beam of radiation onto a surface of the document,

b. a radiation detector spaced from the document and disposed so as to receive the portion of the radiation coming from the document,

c. a very thin reticle having a plurality of precisely spaced markings on one surface thereof,

d. an elongated tubular member associated with the radiation detector,

e. said reticle located between and apart from said radiation source and in association with the detector and the tubular member,

f. said reticle markings being toward the surface of the document and obstructing the flow of radiation through the reticle,

g. a protective cover of a thickness of approximately 0.003 inches positioned in contact with the document surface and in supportive contact with said reticle over the full surface thereof so that said reticle markings over the full surface thereof are positioned in parallel relation to the document surface and approximately 0.003 inches from the document,

h. a separate frame mounting the reticle and protective cover in supportive juxtaposition and operatively connected to the end of the tubular member,

i. said protective cover being of a material highly transparent to said radiation and highly resistant to abrasion,

j. a detecting circuit for determining when the radiation passing to the detector corresponds to that passing through a valid piece of currency, and

k. means for selectively effecting relative movement between said reticle and the document with the document in contact with the protective covering, and with the protective covering maintaining the parallel relation of the reticle to the document during such relative movement.

4,056,732

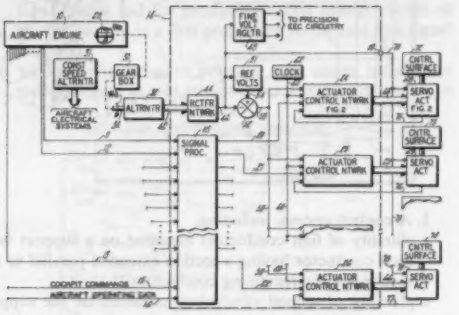
VOLTAGE REGULATION IN AN ELECTRONIC ENGINE CONTROL SYSTEM HAVING DIGITAL EFFECTOR ACTUATORS

Anthony Newman Martin, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 24, 1976, Ser. No. 717,433

Int. Cl.[2] H02J 3/14

U.S. Cl. 307—33 7 Claims



1. In a system for controlling the position of a controlled surface with a servo actuator of the type having a mechanical assembly for providing displacement of the controlled surface in each of two directions in response to a magnetic field provided by a respective one of two oppositely polarized solenoids disposed within the actuator, the system receiving electrical power from an unregulated voltage source and each solenoid providing a corresponding polarity magnetic field in response to an unregulated voltage signal from the voltage source presented through a corresponding one of a pair of solenoid gated switches in response to the ON portion of a gating signal presented to a gate input thereof, the system including a control unit for providing position change gate signals in response to a displacement signal presented thereto, each position change gate signal having an ON portion and an OFF portion with the time duration of the ON portion being proportional to the magnitude of the displacement signal, the control unit presenting the position change gate signals to the gate signal input of a respective one of the gated switches through a corresponding one of a pair of output lines in dependence on the polarity of the displacement signal, circuitry for providing voltage regulation of the unregulated voltage source, comprising:

signal means for providing a reference voltage signal;

summing means, responsive to the unregulated voltage signal and to the reference voltage signal, for providing a voltage error signal in response to an unregulated voltage signal having an absolute value amplitude greater than that of the reference voltage signal, the error signal having a magnitude proportional to the difference therebetween; and

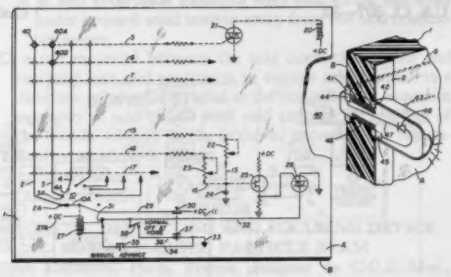
regulation means, responsive to the voltage error signal and to the position change gate signals, for presenting the voltage regulation gate signals to the gate input of both gated switches simultaneously, in response to the presence of a voltage error signal in the absence of a position change gate signal ON portion, to provide concurrent energizing of both solenoids for a time duration proportional to magnitude of the voltage error signal, said regulation means not presenting the regulation gate signals to the gated switches in the presence of a position change gate signal ON portion.

4,056,733

PANEL BOARD

Floyd L. Prestridge, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 2, 1976, Ser. No. 646,220
Int. Cl.[2] H01H *47/04*
U.S. Cl. 307—115 **6 Claims**



1. A control system, including,
a plurality of first conductors mounted on a support with each conductor having a section extended parallel to the sections of the remaining conductors,
a plurality of second conductors mounted on the support with each conductor having a section extended parallel to the sections of the remaining conductors and a constant distance from all sections of the first conductors,
a plurality of third conductors mounted on the support with each conductor having a section extended parallel to the sections of the remaining conductors and a constant distance from all sections of the first conductors,
a multiple-position switch mounted on the support with each of its contactors electrically connected to one of the first conductors,
an advance mechanism including a switch arm element for cycling the switch to each of its contactors,
a source of electrical power connected to the switch arm element,
a first work circuit connected to each of the second conductors,
a second work circuit connected between each of the third conductors and the advance mechanism of the multiple-position switch and including a manually adjustable time delay system which determines time dwell of the switch at that one of the first conductors connected to one of the third conductors,
a first conductive element which is manually positioned through the support to electrically connect one of the first conductor sections with one of the second conductor sections,
and a second conductive element which is manually positioned through the support to electrically connected one of the first conductor sections with one of the third conductor sections.

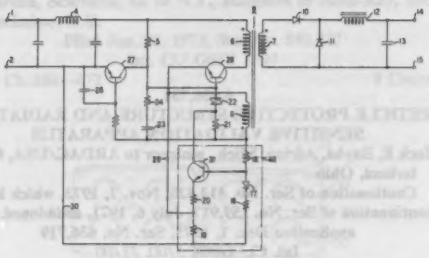
4,056,734

COMPENSATED BASE DRIVE CIRCUIT TO REGULATE SATURATED TRANSISTOR CURRENT GAIN

William Anders Peterson, Lake Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 2, 1976, Ser. No. 702,038
Int. Cl.[2] H03K *17/60*
U.S. Cl. 307—254 **4 Claims**

1. In combination,
a power transistor operating in a saturated mode,
means for supplying a base drive current to said power transistor,
means for diverting base drive current from a base of said power transistor, comprising
a current drain transistor connected to the base of said power transistor,
means for establishing a control bias coupled to a control electrode of said current drain transistor, and
means for sensing the current magnitude of current in a main conduction path of said power transistor, said means for sensing operative to generate a signal proportional to said



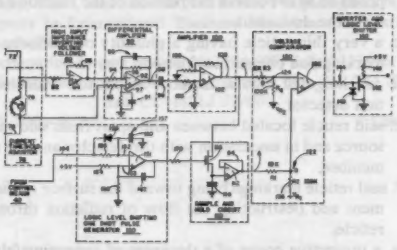
current magnitude and connected to an output electrode of said current drain transistor, said means for sensing further coupled to said means for establishing a control bias in order to control a magnitude of a control bias established therein, whereby a magnitude of current diverted from said base of said power transistor is controlled by said signal proportional to said current magnitude.

4,056,735

ONE SHOT PULSE GENERATOR AND LOGIC LEVEL CONVERTER CIRCUIT

Robert L. Caswell, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 461,177, April 15, 1974. This application June 1, 1976, Ser. No. 691,755
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—273 **4 Claims**



1. A one shot pulse generating and logic level converting system having an input terminal and an output terminal and comprising in combination:
amplifier means having a first, non-inverting, input terminal and a second, inverting, input terminal and an output terminal;
capacitor means connected between said output terminal of said amplifier means and said first input terminal of said amplifier means for providing positive feedback;
said output terminal of said amplifier means comprising said output terminal of said generating and converting system;
circuit means connecting said input terminal of said generating and converting system to said second input terminal of said amplifier means;
voltage divider means connected between a first reference potential and a second reference potential different from said first reference potential, said voltage divider means having a tap thereof connected to said first input terminal of said amplifier means for establishing a quiescent voltage

at said first input terminal of said amplifier means, whereby when the voltage applied to second input terminal of said amplifier means is more negative than said quiescent voltage, then the output voltage from said generating and converting system is at its most positive value and when the voltage applied to said second input terminal of said amplifier means is more positive than said quiescent voltage, then the output voltage from said generating and converting system is at its most negative value.

4,056,736

INJECTION LOGIC ARRANGEMENTS

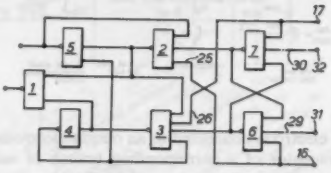
Victor Blatt, Northampton, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Feb. 27, 1976, Ser. No. 662,273

Claims priority, application United Kingdom, Mar. 11, 1975, 09964/75

Int. Cl.² H03K *3/286, 19/08, 19/20*

U.S. Cl. 307—289 **8 Claims**



1. An integrated injection logic flip flop arrangement comprising

a. first and second input gates each having first and second independent outputs;

b. first and second cross-coupled gates each having first and second independent outputs;

c. means for cross-coupling said first and second cross-coupled gates wherein an input of said first cross-coupled gate is coupled to said first independent output of said second cross-coupled gate, and an input of said second cross-coupled gate is coupled to said first independent output of said first cross-coupled gate;

d. means for connecting said first independent output of said first input gate to said input of said first cross-coupled gate;

e. means for connecting said first independent output of said second input gate to said input of said second cross-coupled gate;

f. first combining means for combining said second independent output of said first input gate with said second independent output of said second cross-coupled gate; and

g. second combining means for combining said second independent output of said second input gate with said second independent output of said first cross-coupled gate, thus providing two alternative outputs for the flip flop.

4,056,737

ANTI-ALIASING PRE-FILTER CIRCUIT FOR SEMICONDUCTOR CHARGE TRANSFER DEVICE

Carlo Heinrich Sequin, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 7, 1976, Ser. No. 720,885

Int. Cl.² H03K *3/353;* **H03H** *7/10;* **H01L** *29/78*

U.S. Cl. 307—304 **11 Claims**

1. Semiconductor apparatus comprising:

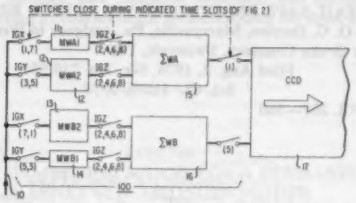
a. time determining means for producing first and second activating signals at predetermined at least first and second difference times;

b. input means, responsive to an electrical input signal, for generating charges in a semiconductor body in accordance with said input signal;

c. switching means, responsive to said activating signals, for enabling the flow of first and second amounts of said charges, respectively, developed in said input means in accordance with first and second signal samples taken of the said electrical signal at said first and second times, respectively;

d. first semiconductor potential well means including a first region in the semiconductor body, responsive to said input means, for receiving said first amount of charges from said input means and for producing a first charge packet of charge content in a first proportion to the said first signal sample;

e. second semiconductor potential well means including a second region in said semiconductor body, responsive to



said input means, for receiving said second amount of charges from the input means and for producing a second charge packet of charge content in a second, different proportion to the said second signal sample;

f. third semiconductor potential well means including a third region in said semiconductor body, responsive to said first and second means, for receiving said first and second charge packets at third and fourth times and for summing together said first and second charge packets, to form a third charge packet of charge content equal at least to the sum of the charge contents of said first and second charge packets; and

g. fourth means for delivering said third packet to a fourth region in said body at a fifth time; said first, second, third, and fourth regions being integrated in a single semiconductor substrate.

4,056,738

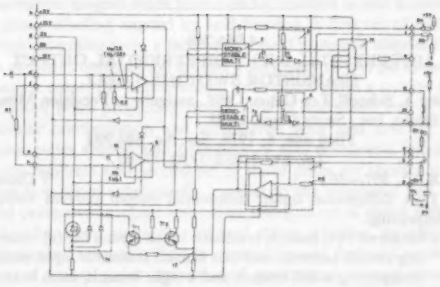
THRESHOLD CIRCUIT

Kjell Arne Håkan Gustafson, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Jan. 29, 1976, Ser. No. 653,324

Int. Cl.² H03K *5/20, 5/18*

U.S. Cl. 307—359 **6 Claims**



1. A threshold circuit for signal receiving equipment particularly suited for use in signalling to or from a rapidly flying object such as a missile or rocket having means for establishing a threshold with an input for receiving signal pulses and noise

pulses and an output for emitting pulses corresponding to those pulses at said input which pass the threshold circuit, wherein the improvement comprises:

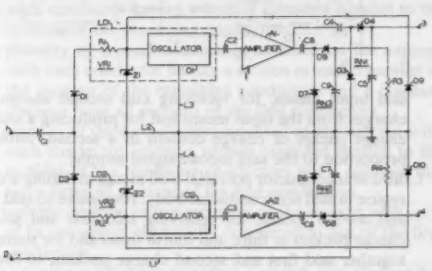
first and second control means, responsive to said input pulses and noise pulses for generating a first or second threshold within first or second predetermined threshold ranges, said first control means producing a first threshold in response to a condition when said input signal pulses and noise pulses exceed a predetermined reference level for a predetermined period of time with a predetermined number of pulses per unit time, for limiting the number of noise pulses per unit time passing to said output, said second control means producing a second threshold in the absence of said condition, wherein said second threshold is lower than said first threshold.

4,056,739

FAIL-SAFE ELECTRONIC POLARIZED RELAY

John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Aug. 2, 1976, Ser. No. 710,554
Int. Cl.² H03K *5/18*
U.S. Cl. 307—360 **10 Claims**



1. A fail-safe electronic polarized relay circuit comprising, a positive level detector and a negative level detector said positive and said negative level detectors each includes a regulating and an oscillating circuit, said regulating circuit of said first and said second level detectors coupled to a source of periodic input signals, a first amplifier coupled to the output of said oscillating circuit of said positive level detector, a second amplifier coupled to the output of said oscillating circuit of said negative level detector, a first rectifier network coupled to the output of said first amplifier for producing a signal on a first output terminal when the periodic input signal exceeds a predetermined positive value, and a second rectifier network coupled to the output of said second amplifier for producing a signal on a second output terminal when the periodic input signal exceeds a predetermined negative value.

4,056,740

DIFFERENTIAL INPUT-DIFFERENTIAL OUTPUT TRANSISTOR SWITCHING CELL

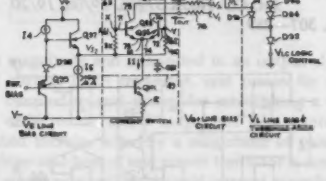
John A. Schoeff, Los Gatos, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Jan. 6, 1976, Ser. No. 646,902
Int. Cl.² H03K *5/20, 17/60*
U.S. Cl. 307—362 **7 Claims**

1. A differential input, differential output current switch comprising,

a balanced two branch transistor input means for (a) receiving switch current, said two branch transistor input means comprising a left branch and a right branch, each branch having an input transistor with a control electrode, an output electrode and a common electrode, each branch having a first node in common to which said common electrode is connected and said switch current is supplied, one of said branches receiving a digital logic signal at the control electrode thereof and the other of said branches receiving a threshold adjustment voltage at the control electrode thereof, and for (b) switching switch current alternately between one of said two branches and the other, in response to said digital logic signal,

a balanced two branch transistor output means for (a) receiving a controlled amount of steering current supplied from a connected source, said two branch transistor output means comprising a left branch and a right branch, each branch having an output transistor with an output electrode for connection to a terminal of a load, having a common electrode connected to a second common node to which said steering current is supplied, and having a



control electrode connected to an output electrode of an input transistor of a corresponding branch of said balanced transistor input means, and for (b) communicating steering current to said load associated with each branch of the output means depending upon the existence of switch current in the corresponding branch of the input means,

a switch current bias circuit means connected to said first node for supplying said switch current in regulated amounts to said first node and,

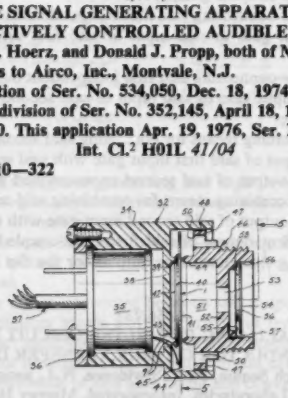
a bias circuit means communicating with the output electrode of each of said input transistors for compensating transients upon switching current between circuit branches.

4,056,741

AUDIBLE SIGNAL GENERATING APPARATUS HAVING SELECTIVELY CONTROLLED AUDIBLE OUTPUT

Richard D. Hoerz, and Donald J. Propp, both of Madison, Wis., assignors to Airco, Inc., Montvale, N.J.

Continuation of Ser. No. 534,050, Dec. 18, 1974, abandoned, which is a division of Ser. No. 352,145, April 18, 1973, Pat. No. 3,872,470. This application Apr. 19, 1976, Ser. No. 677,954
Int. Cl.² H01L *41/04*
U.S. Cl. 310—322 **1 Claim**



1. A crystal sound generating apparatus comprising a housing including a base member from which a substantially circumferential mounting ridge extends for defining a first line contact surface; a plate like crystal unit for generating an audible sound in response to electrical energization thereof, said crystal being affixed to said first line contract surface; a lens unit secured to said housing and having (1) an annular wall

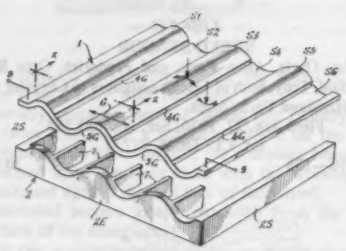
provided with a central opening and spaced from said crystal unit such that said annular wall and crystal unit substantially define a cavity within said lens unit, (2) a circumferential clamping projection extending from said lens unit and aligned with said mounting ridge such that said clamping projection defines a second line contact surface engaging said crystal unit, and (3) a flange portion which together with said housing, said mounting ridge and said clamping projection define an annular chamber into which the crystal unit extends, said flange portion having a plurality of ports formed therein such that said annular chamber is coupled to the ambient; and a reflector disc secured to said lens unit exteriorly of said cavity in a spaced overlying relationship to said central opening such that audible sound generated by electrical energization of said crystal unit is transmitted through said ports and central opening.

4,056,742

TRANSDUCER HAVING PIEZOELECTRIC FILM ARRANGED WITH ALTERNATING CURVATURES

George C. Tibbetts, Camden, Maine, assignor to Tibbetts Industries, Inc., Camden, Maine

Filed Apr. 30, 1976, Ser. No. 682,130
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—357 22 Claims



1. A transducer of the type converting between electrical and mechanical energy by means of the piezoelectric effect in a supported sheet of uniaxially oriented, electrically polarized high polymer film having surface electrodes thereon for connection to an electrical circuit, characterized in that:

the piezoelectric film is arranged with a series of curved substantially cylindrical segments of alternating sign of curvature,

the film being fixedly supported in locations between adjacent segments and being freestanding between said locations, whereby each curved segment functions as a distinct electromechanical transducer, and

the surface electrodes on the film are divided in selected locations between adjacent segments,

whereby the series of individually supported curved segments imparts useful elastic stability to the piezoelectric film, and the individual transducers formed by the supported curved segments and divided surface electrodes may be interconnected electrically to obtain desired transfer and impedance characteristics in the transducer.

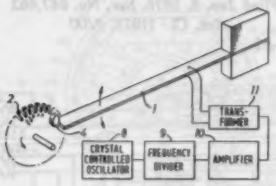
4,056,743

OSCILLATING REED ELECTRIC MOTORS

Cecil Frank Clifford, and Laurence Harry Finlayson, both of Bath, England, assignors to Horstmann Clifford Magnetics Ltd., Somerset, England

Continuation-in-part of Ser. No. 492,176, July 26, 1974, abandoned. This application Nov. 6, 1975, Ser. No. 629,611
Claims priority, application United Kingdom, July 30, 1973, 36232/73; Aug. 31, 1973, 41131/73
Int. Cl.[2] H02K *33/00*
U.S. Cl. 310—21 13 Claims

1. An electric motor comprising a mechanically oscillatory element, a magnetic coupling cooperating with the oscillatory element, a rotor cooperating with the magnetic coupling, a permanent magnet carried by the oscillatory element, a driving coil interacting with said permanent magnet, and means for supplying to the driving coil signals to effect oscillation of the



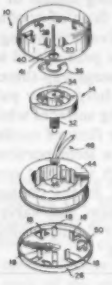
oscillatory element and thereby impart continuous rotation to the rotor through said magnetic coupling, said permanent magnet having a cross sectional area exceeding the square of its length.

4,056,744

NOISE DAMPENING MEANS FOR A PERMANENT MAGNET SYNCHRONOUS MOTOR

James S. Blanchard, and Charles E. Kapper, both of Indianapolis, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 479,800, June 17, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,661
Int. Cl.[2] H02K *5/24*
U.S. Cl. 310—51 5 Claims



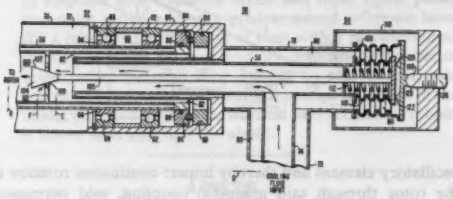
1. In a permanent magnet synchronous motor that includes a housing comprising a field plate secured to a stator cup, a permanent magnet rotor journaled for rotation in said housing, a stator winding carried by said housing, a first set of stator poles extending from a face of said field plate and disposed in an annular configuration around a periphery of said permanent magnet rotor, the improvement which comprises a second set of stator poles projecting from a face of said stator cup in an annular configuration and interleaved with said first set of stator poles around said periphery of said permanent magnet rotor, wherein said second set of stator poles are shorter in a direction taken substantially parallel to the rotational axis of said permanent magnet rotor than said first set of stator poles, whereby, upon energizing of said stator winding, an axially imbalanced magnetic field in created in said first and second sets of stator poles around said permanent magnet rotor, thereby urging said permanent magnet rotor axially against a face of said stator cup to dampen noise caused by axial oscillations of said permanent magnet rotor against said face of said stator cup.

4,056,745

CRYOGEN TRANSFER COUPLING WITH ADJUSTABLE THROTTLE VALVE FOR ROTATING MACHINERY

Phillip W. Eckels, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 8, 1976, Ser. No. 647,462
Int. Cl.[2] H02K 9/00
U.S. Cl. 310—52 2 Claims



1. In a dynamoelectric machine having a rotor member disposed upon a shaft for rotation within an annular stator member, said shaft having a passage for permitting the flow of a cooling fluid therethrough to said rotor member, coupling means secured to said shaft for transferring said cooling fluid from a reservoir to said shaft passage, said coupling means having a first conduit portion connected to the reservoir defining an inlet flow path and a second conduit portion connected to said shaft defining a discharge flow path for said cooling fluid, the inlet flow path being in fluid communication with the reservoir and the discharge flow path being in fluid communication with said shaft passage, said first and second conduit portions being interconnected in an overlapping, radially spaced apart relation by rotatable interconnecting means to define a relative motion gap between the overlapping conduit portions and to permit rotational movement of said second conduit portion relative to said first conduit portion, the combination with said coupling means of an adjustable throttle valve for regulating the flow of cooling fluid passing therethrough, said throttle valve comprising a valve seat disposed within the discharge flow path of said second conduit portion and providing a fluid passageway therethrough, a valve plug disposed within said discharge flow path of said second conduit portion having seating surfaces which cooperate with said valve seat to throttle the flow of cooling fluid therethrough, said valve plug having a stem portion disposed within and extending axially through said first conduit portion for supporting said valve plug, means connected to said stem for axially displacing said stem and valve plug relative to said valve seat, and means for fluidly sealing said relative motion gap from the atmosphere.

4,056,746

COUNTERROTATION ELECTRIC MOTOR

Wilson A. Burtis, 5011 Harvard Ave., Westminster, Calif. 92683

Continuation-in-part of Ser. No. 534,854, Dec. 20, 1974, abandoned, which is a division of Ser. No. 293,652, Sept. 29, 1972, abandoned. This application Oct. 20, 1975, Ser. No. 623,717
Int. Cl.[2] H02K 23/60
U.S. Cl. 310—115 8 Claims

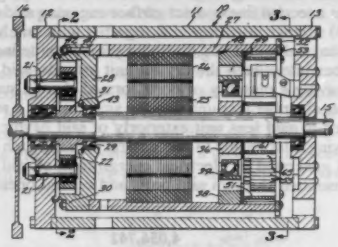
1. In an electric motor having a field and rotor that each has windings thereof, the improvement comprising:

a. counter-rotating means disposed between said rotor and field for rendering said field rotatable in a direction opposite to the rotation of said rotor;

b. commutation means on said field and rotor, said commutation means including a field commutation ring selectively connecting predetermined ones of said windings for excitation and a rotor commutation ring for exciting predetermined other ones of said windings;

c. a casing supporting in rotation with said field and rotor; and

d. brush means disposed in said casing for providing electrical connection to said commutation means, said brush means including two adjustable rings mounted for rotation on said motor, each ring including a corresponding set of brushes for controlling the relative phase angle between the excitation of said one winding and said other winding according to the relative angular alignment thereof.

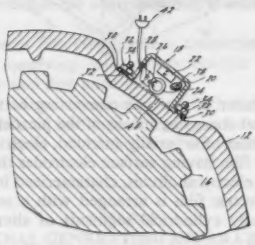


4,056,747

SPEED SENSOR

Stephen Jay Orris, Allen Park, and Frederick Otto Richard Miesterfeld, Troy, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 22, 1976, Ser. No. 651,385
Int. Cl.[2] H02K 21/38
U.S. Cl. 310—155 20 Claims



1. In a system for providing a speed signal the combination comprising:

a toothed ferromagnetic reluctor member contained interiorly of a casing, said casing having an imperforate non-ferromagnetic wall portion and said ferromagnetic reluctor member being disposed such that teeth thereof confront said imperforate non-ferromagnetic wall portion;

an electromagnetic speed pick-up device disposed exteriorly of said casing and confronting said imperforate non-ferromagnetic wall portion, said device including a magnetic flux source creating a magnetic circuit which exits said device and enters said casing via said imperforate non-ferromagnetic wall portion, passes through said toothed ferromagnetic member, and exits said casing and re-enters said device via said imperforate non-ferromagnetic wall portion, said device comprising an inductance coil electromagnetically coupled with said magnetic circuit;

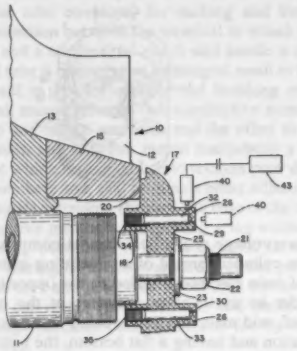
and means for moving said toothed ferromagentic reluctor member relative to said casing such that teeth of said member move past said imperforate non-ferromagnetic wall portion and cause a speed siganl representative of the speed of movement of said member to be provided by said coil.

4,056,748

MAGNETIC SPEED PICKUP

Robert L. Cross, Jr., West Newton; M. Raymond Hill, North Huntingdon Township, Westmoreland County, and Fred Tucker, Jeannette, all of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,745
Int. Cl.[2] H02K *19/20*
U.S. Cl. 310—168 9 Claims



1. A magnetic pickup for sensing the speed of a wheel mounted upon a rotor shaft including

a generally annular nosepiece having two radially opposed surfaces comprising a working surface on the backside thereof and an outer surface, the nosepiece being slidably mounted upon the rotor shaft with the working surface positioned against the end face of the wheel,

an embossed section axially extended from the opposed surface of the nosepiece,

at least one magnet mounted within an axially aligned blind opening passing from the backside of the nosepiece into the embossed section,

a plug secured within the opening for positioning the magnet within the embossed section and preventing the magnet from escaping from the opening,

means operatively associated with the shaft for securing the working surface of the nosepiece against the wheel whereby the nosepiece moves with the wheel, and

stationary detecting means positioned adjacent the embossed section for sensing the passage of the magnet therebeneath.

4,056,749

MODULAR MOTOR

Christian R. Carlson, Jr., and Michael J. Hillyer, both of Mechanicsburg, Pa., assignors to General Signal Corporation, Rochester, N.Y.

Filed Jan. 19, 1976, Ser. No. 650,383
Int. Cl.[2] H02K *13/00*
U.S. Cl. 310—239 15 Claims

1. A modular motor assembly comprising in combination:

a. an armature assembly including a commutator;

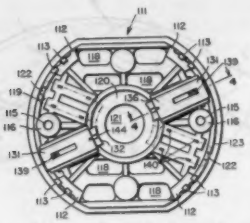
b. a structure for providing a magnetic field for said armature assembly;

c. a modular terminal assembly for mounting in a fixed physical relationship with respect to said structure and having a plurality of terminals formed thereon with at least some having electrical connection to said structure;

d. a bracket assembly for mounting in a predetermined physical relationship with respect to said terminal assembly;

e. a brush holder supported on said bracket assembly for retaining a brush in alignment to make contact with said commutator; and

f. said brush holder including an integral preformed projection for engagement with a predetermined one of said plurality of terminals to complete an electrical connection from said brush holder to said predetermined one of said



plurality of terminals in response to said bracket assembly being mounted in its predetermined physical relationship with respect to said terminal assembly.

4,056,750

MERCURY DISPENSER FOR DISCHARGE LAMPS

Frank M. Latassa, Magnolia, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 17, 1976, Ser. No. 751,835
Int. Cl.[2] H01J *61/28*
U.S. Cl. 313—177 2 Claims

1. In an arc discharge lamp having a glass mount at one end with a cathode supported on the mount, the improvement comprising a disintegration shield encircling the cathode except for a narrow gap between the ends of the shield, a mercury containing metal capsule disposed in the gap and electrically connected to the ends of the shield, the portion of the capsule that is connected to the ends of the shield being the lower portion thereof which is more proximate the mount so that when an RF current is induced in the shield the current flow through the capsule primarily occurs through said lower portion.

4,056,751

METAL HALIDE DISCHARGE LAMP HAVING OPTIMUM ELECTRODE LOCATION

W. Calvin Gungle, Danvers, Mass.; Federic Koury, Alexandria, N.H., and William M. Keeffe, Rockport, Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 22, 1976, Ser. No. 669,055
Int. Cl.[2] H01J *61/20*
U.S. Cl. 313—217 1 Claim

1. In a metal halide arc discharge lamp having an arched arc tube containing a fill of mercury, metal halide and inert gas and having electrodes sealed in each end of the arc tube and

wherein the arc tube is normally operated in a horizontal position with the arch uppermost, the improvement which

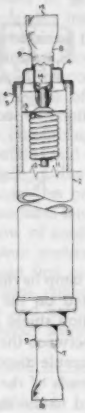
comprises the electrodes being located about midway between the arc tube axis and the lower wall of the arc tube.

4,056,752

CERAMIC LAMP HAVING TUBULAR INLEAD CONTAINING YTTRIUM-ZIRCONIUM MIXTURE

Stanley F. Bubar, Chagrin Falls, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed July 1, 1976, Ser. No. 701,553
Int. Cl.² H01J *61/06, 61/36*
U.S. Cl. 313—217 **5 Claims**



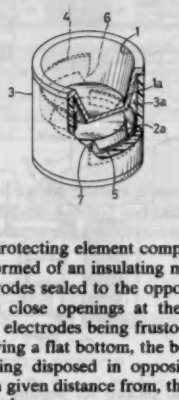
1. An electric lamp arc tube comprising:
- a light-transmitting ceramic envelope having end closures sealing its ends and containing a discharge-sustaining filling including a vaporizable metal,
- electrodes supported from said closures at opposite ends of said envelope,
- one of said closures including a tubular niobium or tantalum inlead having a portion extending into the interior of said envelope,
- the electrode supported by said one closure comprising an emitting portion mounted on a tungsten shank,
- said tungsten shank extending from the interiorly extending portion of said inlead and being quasi-hermetically fastened thereto,
- and a mixture of yttrium and zirconium within said inlead at the joint with said tungsten shank, said mixture having been melted in place to form a braze penetrating any pores at the joint in order to assure a hermetic seal between said tungsten shank and said niobium inlead.

4,056,753

OVERVOLTAGE PROTECTING ELEMENT

Tsukioka Keikichi, and Takayanagi Yukio, both of Sagamihara, Japan, assignors to Kabushiki Kaisha Sankosha, Tokyo, Japan

Filed Feb. 13, 1976, Ser. No. 657,858
Int. Cl.² H01J *17/00, 21/00*
U.S. Cl. 313—325 **5 Claims**



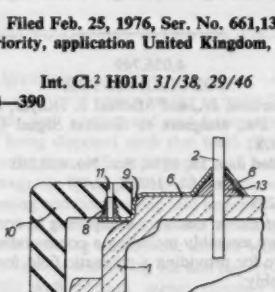
1. An overvoltage protecting element comprising:
- a hollow cylinder formed of an insulating material;
- a pair of main electrodes sealed to the opposite ends of the cylinder so as to close openings at the opposite ends thereof, said main electrodes being frusto-conical in configuration and having a flat bottom, the bottom of one of the electrodes being disposed in opposing relationship with, and spaced a given distance from, the bottom of the other electrode; and
- a pair of conductive layers disposed on the inner wall of the cylinder in opposed and spaced relationship with a different one of the main electrodes, said conductive layers being separated from each other by a space and being electrically insulated the main electrodes, each of said conductive layers having at least one projection which extends toward the other main electrode, said conductive layers extending around the inner wall of the cylinder over an angle not greater than 360° and being spaced from each other in the axial and circumferential directions of the cylinder.

4,056,754

VIDICON HAVING SWITCHABLE ELECTRODE CONNECTIONS

Philip Charles Bailey, Writtle, and Hans Scholz, Maldon, both of England, assignors to Electric Valve Company Limited, England

Filed Feb. 25, 1976, Ser. No. 661,131
Claims priority, application United Kingdom, Mar. 1, 1975, 8656/75
Int. Cl.² H01J *31/38, 29/46*
U.S. Cl. 313—390 **2 Claims**



1. A vidicon tube including within an envelope, a target, a target electrode in electrical contact with the target, an anode of which the portion nearest the target cylindrical, a field mesh electrically isolated from and positioned closely adjacent the target electrode between the target electrode and the cylindrical postion of the anode, terminal means passing through the envelope, and electrical connection means electrically con-

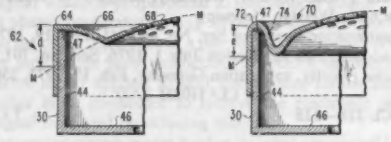
necting the terminal means to the field mesh; wherein, the electrical connection means includes a conductive cylindrical member coaxial with and surrounding the anode and extending at least approximately to the end of the cylindrical portion of the anode, the opposite end portions of the cylindrical member being electrically connected, respectively, to the perimeter of the field mesh and to a plurality of electrical conductors which are disposed symmetrically about the axis of the tube and extend to the terminal means, and wherein means are provided, outside of the tube envelope, for making and breaking an electrical connection between the terminal to which said mesh is connected and a terminal to which said anode is connected whereby said tube is operative as an integral mesh or a separate mesh tube, said means for making and breaking comprising removable link means between two conductive members connected one to one of said terminals and the other to the other of said terminals, and said link means comprising a short circuiting bridge which is pluggable into sockets provided in said conductive members and, said terminals being adjacent ones of a ring of terminals extending through the base of the tube, each of said conductive members comprising a tag extending substantially radially outwardly from the terminal to which it is attached and bearing its socket outwardly of the periphery of the base of the tube and in a position covered by the normally provided base cap of the tube, access to said sockets for said pluggable bridge member being provided for by holes provided in said cap.

4,056,755

COLOR PICTURE TUBE HAVING MASK-FRAME ASSEMBLY WITH REDUCED THICKNESS

Frank Myung-Hi Sohn, Leola, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,733
Int. Cl.² H01J *29/80*
U.S. Cl. 313—402 **3 Claims**



1. In an apertured mask type color picture tube having a mask attached to a peripheral frame which is suspended within said tube adjacent a screen of said tube, said frame including a flange substantially parallel to the longitudinal axis of said tube, said mask including a domed central apertured portion, a border portion surrounding said apertured portion and a skirt portion surrounding said border portion, the improvement comprising,

said mask being telescoped within said frame and at least a part of said skirt portion being parallel with said flange and extending toward said screen.

4,056,756

ANODE ASSEMBLY FOR ELECTRON DISCHARGE DEVICES

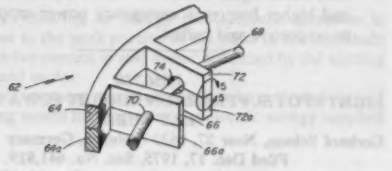
Palmer P. Derby, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 571,891, April 25, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 724,813
Int. Cl.² H01J *23/22*
U.S. Cl. 315—39.69 **19 Claims**

1. An anode for a magnetron comprising:

a plurality of substantially conductive members each having a cylindrical boundary wall portion formed integrally with a plurality of vane sections which extend from said wall portions inwardly to a central bore;

at least one annular conductive strap member contacting alternate vane sections of each conductive member adjacent said bore; and



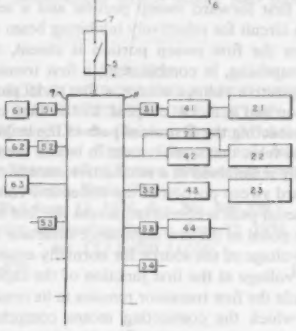
said members being bonded into a rigid unit by nonthermal metallurgical techniques.

4,056,757

EMERGENCY LIGHTING SYSTEM

Robert E. Mauch, and Robert I. Sarbacher, both of Santa Monica, Calif., assignors to John C. Bogue, Santa Monica, Calif.

Filed Mar. 2, 1972, Ser. No. 231,220
Int. Cl.² H05B *37/00*
U.S. Cl. 315—86 **10 Claims**



1. In combination with a lighting system comprising an alternating current utility power source, an "on-off" switch and a plurality of fluorescent lights coupled to said utility power source through said "on-off" switch, each one of said plurality of fluorescent lights being provided with a ballast, an emergency system comprising:

an emergency power supply having a frequency higher than the frequency of said utility power source;

a transfer switch having a first contact directly connected to said utility power source, a second contact connected to said emergency power supply and a switch arm connected to said "on-off" switch, said transfer switch being so arranged that said switch arm is closed on said first contact when power is available from said utility power source and is automatically transferred from said first contact to said second contact when power is not available from said utility power source whereby power for illuminating said plurality of fluorescent lights is provided by said emergency power supply through said "on-off" switch when power is not available from said utility power source; and

means for illuminating one or more but not all of said plurality of fluorescent lights when power for illuminating said plurality of fluorescent lights is provided by said emergency power supply, said ballast provided with each one of said plurality of fluorescent lights presenting such a

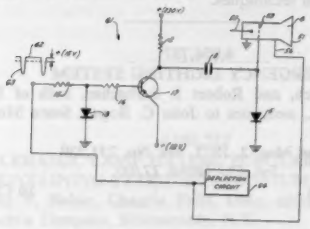
high impedance to said higher frequency power from said emergency power supply that each one of said plurality of fluorescent lights cannot be effectively illuminated from said higher frequency emergency power supply through its respective said ballast.

4,056,758

LIGHT SPOT SUPPRESSION CIRCUIT FOR A CATHODE RAY TUBE

Gerhard Schaas, Near 27, 8633 Steinrod, Germany

Filed Dec. 17, 1975, Ser. No. 641,819
Claims priority, application Germany, Dec. 21, 1974, 2460940
Int. Cl.² H01J *29/52*
U.S. Cl. 315—381 **10 Claims**



1. In a cathode ray tube operable with a deflection voltage having a first forward sweep portion and a second flyback portion, a circuit for selectively inhibiting beam current in the tube when the first sweep portion is absent, the inhibiting means comprising, in combination, a first transistor connectable to a positive voltage source, a first serial path comprising a capacitor and a diode coupled to the first transistor, and means connecting the first serial path to the brightness control grid of the tube, the improvement in which the first transistor is normally maintained in a conductive state in the absence of the forward sweep portion of the deflection voltage; in which the first serial path is connected across the first transistor with the diode poled in the low impedance direction relative to the positive voltage of the source for normally establishing a high negative voltage at the first junction of the capacitor and the diode while the first transistor remains in its conductive condition; in which the connecting means comprises means for applying the voltage at the first junction to the brightness control grid of the tube whereby the high negative voltage normally at the first junction will inhibit beam current in the tube while the first transistor remains conductive; and in which the circuit further comprises means coupled to the base of the first transistor and responsive to the first sweep portion of the deflection voltage for positively switching the first transistor into a non-conductive state during the first sweep portion to impart to the first junction, and thereby to the brightness control grid of the tube, a positive step in voltage sufficient to permit the flow of beam current in the tube.

4,056,759

DRIVING SYSTEM FOR MOVING PATHS OR ESCALATORS

Nobuo Mitsui; Akinori Watanabe; Takeshi Oohira; Kazuhiko Kawauchi, all of Katsuta; Shoichi Nakao, Mito, and Katsuya Teranishi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 3, 1974, Ser. No. 475,801
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976
Claims priority, application Japan, June 4, 1973, 48-61894
Int. Cl.² H02P *7/00*
U.S. Cl. 318—98 **10 Claims**

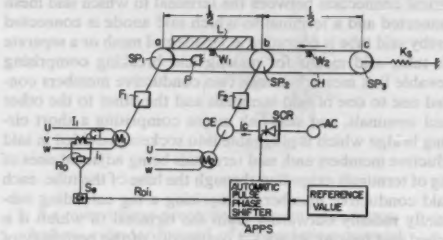
1. A driving system for moving paths or escalators which use an endless chain adapted to be circulated between a path for transporting passengers, comprising:

a first and a second sprocket disposed at one end portion and substantially middle portion of said path, respectively;

a first motor for driving said first sprocket;

a second motor for driving said second sprocket;

means for detecting a quantity corresponding to a loaded weight acting upon said endless chain;



means for setting a reference value; and

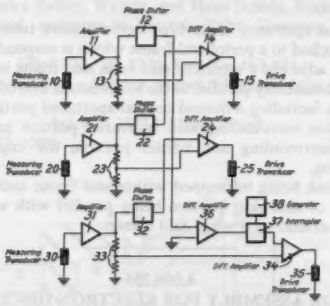
means for controlling a torque to be applied upon said second sprocket in response to an output from said detecting means, said torque controlling means including means for increasing the torque to be applied upon said second sprocket in response to an excess developed when the output of said detecting means exceeds said reference value.

4,056,760

METHOD OF DRIVING A TWO COORDINATE OSCILLATOR AND CIRCUIT ARRANGEMENT THEREFOR

Helmuth Frenk, Wetzlar, Germany, assignor to Ernst Leitz G.m.b.H., Wetzlar, Germany

Continuation-in-part of Ser. No. 443,241, Feb. 19, 1974, abandoned. This application July 1, 1976, Ser. No. 701,700
Claims priority, application Germany, Feb. 19, 1973, 2308024
Int. Cl.² H02H *7/00*
U.S. Cl. 318—115 **7 Claims**



1. A method of driving a two coordinate mechanical oscillator with the aid of a deformed rotating field of forces defined by a plurality of exciting and pick-up components, the method comprising the steps of:

a. deriving a plurality of first electrical signals each corresponding to the mechanical motion of the oscillator in a respective one of the component directions;

b. imparting to each first signal a phase shift equal to the geometrical angle between cyclically preceding ones of the pick-up components;

c. comparing in the cyclical sequence given by each undis-

placed first signal the deformed rotating field of forces adjacent to the exciting and pick-up components corresponding to the respective first signal with the phase displaced signal corresponding to the preceding pick-up component next adjacent;

d. deriving a respective difference signal from each comparison; and

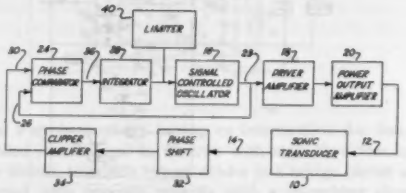
e. applying each difference signal to respective exciting means of the mechanical oscillator associated with the component corresponding to the respective first undisplaced signal.

4,056,761

SONIC TRANSDUCER AND DRIVE CIRCUIT

Benjamin Franklin Jacoby, Columbus, and Marvin E. Monroe, Sunbury, both of Ohio, assignors to Quintron, Inc., Columbus, Ohio

Filed Sept. 11, 1975, Ser. No. 612,358
Int. Cl.² H01L *41/10*
U.S. Cl. 318—116 **13 Claims**



1. A sonic tool comprising:

a. a sonic transducer including electromechanical transducing means for the application of a periodic electronic drive signal thereto to produce a mechanical stress for driving said transducer and for generating an electronic pickup signal which is proportional to mechanical strain;

b. a phase comparator having an output signal proportional to the phase difference of a pair of periodic signals at a pair of inputs, one input connected to receive the electronic drive signal applied to said transducing means and the other input connected to receive the electronic pickup signal from said transducing means;

c. integrator circuit means having its input connected to the output of said phase comparator;

d. an electronic signal controlled oscillator having its input control terminal connected for control by the output of said integrator circuit means and its output connected for exciting said transducing means with said drive signal;

e. limiter circuit means connected to the input control terminal of said oscillator for limiting the escursions of the control signal to confine it within a selected range; and

f. an adjustable phase shift network means and amplitude limiting circuit means electrically interposed in cascade between said transducing means and said phase comparator for introducing a selected phase shift in said pickup signal and for making the input pickup signal applied to said phase detector independent of the amplitude of the pickup signal from said transducing means.

4,056,762

STROKE ENERGY LIMITED MOTOR-DRIVEN SCREWDRIVER

Fritz Schädlich, Stetten, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

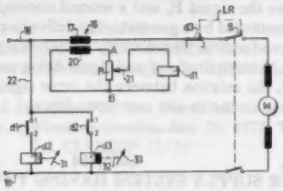
Filed Feb. 27, 1976, Ser. No. 661,949
Claims priority, application Germany, Apr. 17, 1975, 2516951
Int. Cl.² H02H *7/085*
U.S. Cl. 318—484 **11 Claims**

1. A motor-driven screwdriver having a drive motor capable of a.c. operation and having means for automatically controlling the duration of continuous motor operation, comprising, in combination:

means for shutting off the motor in response to an electric signal;

means for initiating an energy measurement operation in response to the peak portion of the pulse in the amplitude of the drive current in said motor produced by the starting up of said motor;

energy measurement means arranged to be activated by said initiating means for measuring the electric energy supplied



to the drive motor after the starting up thereof and for providing an electric signal to said means for shutting off said motor when the measured energy reaches a predetermined value, said energy measurement means being arranged also to be de-activated when said motor is shut off, and

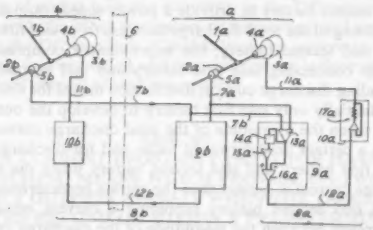
means responsive to the lapse of a predetermined time following deactivation of said measurement means for resetting said measurement means before said motor is restarted.

4,056,763

DEVICE FOR CONTROLLING A MECHANICAL ELEMENT WITH EFFORT RETURN

Guy Debrie, Massy; Claude Grenier, Orsay; Michel Petit, La Celle St-Cloud; Henri Rigaut, Limours, and Jean Vertut, Issy-les-Moulineaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed June 12, 1975, Ser. No. 586,229
Claims priority, application France, June 19, 1974, 74.21355
Int. Cl.² G05B *11/14*
U.S. Cl. 318—675 **12 Claims**



1. A device which serves to control a mechanical assembly of the so-called "slave" type in displacements and in efforts and is actuated by a motor element, wherein said mechanical assembly is reversible and comprises a position detector for delivering a signal which is proportional to the displacements of said assembly and wherein said device comprises an assembly for controlling said motor element and delivering a signal constituting orders relating to the positions of said motor element, means for producing an error signal ϵ which is proportional to the difference between the signal delivered by the detector and the signal delivered by said control assembly, a generator for delivering a physical signal which produces action directly on the torque of the motor element, the amplitude of said signal being proportional to the signal ϵ, the relation between the error signal and the torque being thus in

one-to-one correspondence, the error signal being also fed back into said control assembly, said control assembly being constituted by a second mechanical assembly actuated by a second motor element comprising a second position detector, and wherein each motor element is controlled independently by a control loop circuit, each loop circuit being provided with means for generating an error signal ϵ which is proportional to the difference between the signals emitted by said detectors, means for providing a derivative of said error signal ϵ so as to give a signal ϵ' which is proportional to said derivative, means for determining the difference between the signals ϵ and ϵ' so as to give the signal E, and a second correspondence control stage constituted by a generator for delivering a physical signal which produces action directly on the torque of the motor element, the amplitude of said signal being proportional to the signal E, the relation between the error signal and the torque being thus in one-to-one correspondence.

4,056,764

POWER SUPPLY SYSTEM HAVING TWO DIFFERENT TYPES OF BATTERIES AND CURRENT-LIMITING CIRCUIT FOR LOWER OUTPUT BATTERY

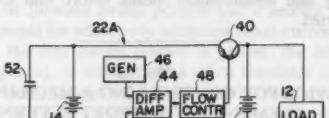
Takuya Endo, and Toshio Hirota, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 30, 1975, Ser. No. 582,387

Claims priority, application Japan, June 3, 1974, 49-61833; June 3, 1974 Japan 49-61834

Int. Cl.[2] H02J 7/00

U.S. Cl. 320—3 **4 Claims**



1. In a power supply system of the type having a first battery and a second battery with a lower open-circuit voltage, higher maximum output current and lower total energy capacity than the first battery, and means connecting said first battery and said second battery to provide a power supply output current consisting of the total discharge currents from said first battery and said second battery; the improvement comprising: said means connecting said first battery and said second battery including discharge current distribution means for discharging substantially only said first battery to develop the output current when the magnitude of the total discharge current is less than a certain predetermined value and for discharging both said first battery and said second battery when the total discharge current is greater than the certain predetermined value with said second battery supplying a current equal to the difference between the magnitude of the discharge current of said first battery and the total output current to maintain the magnitude of the discharge current of said first battery less than the certain predetermined value, wherein the certain predetermined value is selected below a critical current value at which a terminal voltage of said first battery equals an open-circuit voltage of said second battery; said discharge current distribution means comprising current measuring means for measuring the magnitude of the discharge current from said first battery, signal generating means for generating a current signal of said certain predetermined value, comparison means for comparing the magnitude of the discharge current measured by said current measuring means with said current signal to develop a control signal representative of the difference between the measured current and the predetermined current value, and current limiting means responsive to the control signal developed by said comparison means for limiting the maximum magnitude of the discharge current from said first battery to the certain predetermined value.

4,056,765

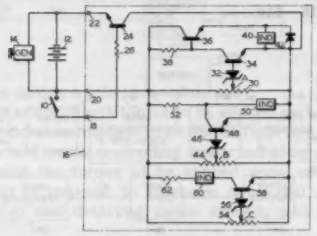
BATTERY-GENERATOR OUTPUT MONITOR

Ralph E. Scheidler, Milwaukie, and Howard H. Morse, Portland, both of Oreg., assignors to Howard H. Morse, Portland, Oreg.

Filed Oct. 20, 1975, Ser. No. 623,723

Int. Cl.[2] H02J 7/14

U.S. Cl. 320—48 **7 Claims**



1. For use with the battery-generator system of an engine having an electric cranking starter, a battery-generator output monitor, comprising:

a. a first electric circuit including first indicator means for indicating low battery voltage during cranking, and first indicator actuator means having an electric circuit arranged for connection at a first end directly to one of the battery terminals of the battery-generator system and operable when the output voltage drops below a predetermined value during cranking to activate the first indicator means and give indication that the battery voltage drops too low during cranking,

b. a second electric circuit including second indicator means for indicating low generator charging voltage, and second indicator actuator means having an electric circuit arranged for connection at a first end directly to said one battery terminal and operable when the output voltage drops below a predetermined value higher than the first named predetermined value to activate said second indicator means and give indication that the generator is providing insufficient voltage to charge the battery,

c. a third electric circuit including third indicator means for indicating high generator charging voltage, and third indicator actuator means having an electric circuit arranged for connection at a first end directly to said one battery terminal and operable when the output voltage exceeds a predetermined maximum to activate said third indicator means and give indication that the generator is producing excessively high charging voltage,

d. electric control switch means connected at one end to the second end of the electric circuits of the first, second and third indicator actuator means and arranged for connection of its opposite end directly to the other of said battery terminals, and

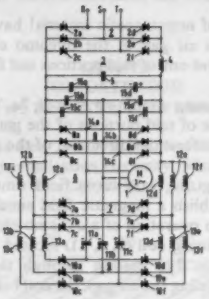
e. electric switch actuator means associated with the control switch means and operable upon connection to a source of electric potential to close said control switch means and connect said first, second and third indicator actuator circuits across said battery terminals.

4,056,766

COMMUTATION CIRCUIT FOR A CYCLOCONVERTER WITH INTERMEDIATE D.C. LINK

Hans-Hermann Zander, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 26, 1976, Ser. No. 661,426
Claims priority, application Germany, Mar. 10, 1975, 2510357
Int. Cl.[2] H02M 5/257
U.S. Cl. 363—37 10 Claims



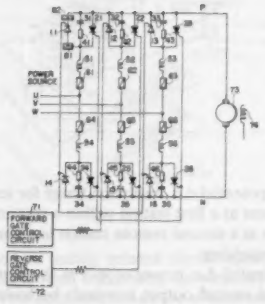
1. In a cycloconverter having an intermediate d-c link, a controlled rectifier and an inverter with main thyristors in a bridge circuit, to which bypass diodes in a bridge circuit are connected with opposite polarity with a quenching circuit including a quenching thyristor and a commutating capacitor connected in parallel to each bridge arm, one commutating capacitor being provided for each two bridge arms which have a common main terminal lead, and commutating chokes arranged in the commutating circuits, the improvement comprising at least one damping capacitor coupled in parallel to a bridge arm for each two bridge arms with a common terminal lead.

4,056,767

COOLING ARRANGEMENT FOR SEMICONDUCTOR CONVERTER DEVICE

Masahiro Tobise; Hiromasa Kogure; Tadahiko Kanbara, and Hiroshi Koseki, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 24, 1976, Ser. No. 717,387
Claims priority, application Japan, Aug. 25, 1975, 50-102153
Int. Cl.[2] H02M 7/00
U.S. Cl. 363—141 4 Claims



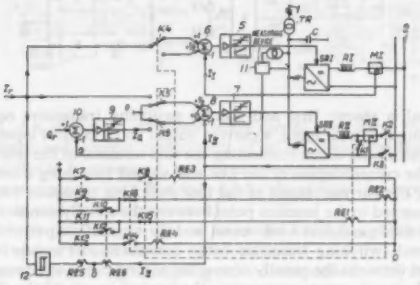
1. In a converter circuit having two sets of converters, each including planar-type semiconductor controlled rectifier elements, connected in a bridge configuration, said converters being connected in parallel, with opposite polarities, to a load, an improved cooling arrangement for said converters wherein said rectifier elements are aligned in sequence along an axis so that the adjacent electrodes of adjacent rectifier elements which belong to respectively different converters are of opposite polarities with respect to each other; and cooling elements are interposed between each pair of adjacent rectifier elements wherein cooling elements are interposed between each adjacent rectifier element in said sequence.

4,056,768

STATIC CONVERTOR PLANT

Sven Ivner, Vasteras, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Jan. 19, 1976, Ser. No. 650,376
Claims priority, application Sweden, Jan. 20, 1975, 7500544
Int. Cl.[2] H02P 13/24
U.S. Cl. 363—79 4 Claims



1. Convertor plant for connection between a DC network and an AC network and comprising at least one convertor group, each said convertor group comprising at least two convertors with AC terminals for connection to the AC network and with DC terminals for connection to the DC network, at least one of said convertors in said at least one connector group including a reactor connected on its DC side and with switching means for alternatively connecting the DC terminals of said at least one convertor to the DC network in parallel with the other convertors or connecting said reactor between the DC terminals of said at least one convertor, control means for controlling said switching means in dependence on the load current of said convertors.

4,056,769

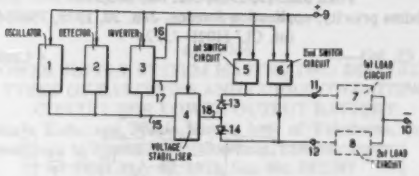
DIRECT CURRENT PROXIMITY DETECTOR HAVING SWITCHING MEANS WHICH PROVIDE ON TWO DISTINCT OUTPUTS, SIGNALS WHEN THE TARGET IS LOCATED BEYOND OR WITHIN A PREDETERMINED RANGE

Marcel Lefebvre, and Alain Rouquet, both of Angouleme, France, assignors to La Telemecanique Electrique, France

Filed Feb. 25, 1976, Ser. No. 661,078
Claims priority, application France, Feb. 27, 1975, 75.06091
Int. Cl.[2] G01R 33/12
U.S. Cl. 324—236 4 Claims

1. A proximity detector comprising: a source of direct current supply having first and second terminal; first and second load circuits; first and second diodes having a common point, the first diode and the first load circuit being serially connected between the common point and the second terminal and the second diode and the second load circuit being serially connected between the common point and the second terminal; a voltage stabilising transistor having a current input, a current output and a control input, the said current output being connected to the said common point; a first Zener diode connect-

ing the first terminal of the source to the said control input; an oscillator power supplied between the first terminal of the source and the current input of the voltage stabilising transistor and having a high frequency output; a detector power supplied between the first terminal of the source and the current input of the voltage stabilising transistor and having an input connected to the high frequency output of the oscillator and an output on which a control signal is generated when the oscillator is in an oscillating state; inverter means power supplied between the first terminal of the source and the current input of the voltage stabilising transistor and having an input connected to the output of the detector and first and second control outputs, said inverter means providing a signal on the first output thereof when the said control signal is present and a signal on the second output thereof when the said control



signal is absent; first and second switching transistors each having a current input, a current output and a control input; a second Zener diode connecting the first terminal of the source to the current inputs of the first and second switching transistors, the current output of the first switching transistor being connected to the junction point between the serially connected first diode and first load circuit and the current output of the second switching transistor being connected to the junction point between the serially connected second diode and second load circuit, means connecting the control inputs of the first and second switching transistors respectively to the first and second control outputs of the inverter means; and first and second resistors respectively connecting the control input of the voltage stabilising transistor to the respective junction points between the serially connected first and second diodes and first and second load circuits.

4,056,770

DYNAMO ELECTRIC MACHINE PERMANENT MAGNET FLUX TEST APPARATUS WHICH SIMULATES ACTUAL FLUX CONDITIONS OF THE MOTOR

Adolf Mohr, Buhlertal; Wolfgang Sohn, Buhl-Vimbuch, and Georg Strobl, Buhl, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 27, 1976, Ser. No. 726,874
Claims priority, application Germany, Sept. 25, 1975, 2542774
Int. Cl.² G01R *33/12*
U.S. Cl. 324—205 **14 Claims**

1. Dynamo electric machine permanent magnet test apparatus to test the magnetic flux emanating from part circular permanent magnet segment of arcuate cross section comprising

a gauage **(1, 9)** which is at least partly cylindrical and of material having soft iron characteristics, including a smaller part cylindrical segmental portion **(1*a*, 12*a*)** adapted for placement within the arcuate magnet segment, and a larger arcuate part cylindrical portion **(1*c*, 12*b*)** adapted for placement outside of the arcuate magnet segment **(2)**, means **(1*b*, 13, 14, 15)** magnetically connecting said smaller, inner portion and said larger outer portion to form a magnetic circuit structure having soft iron characteristics, and an opening coaxial with said portions, separating said portions and shaped to receive the magnet segment **(2)**;

a layer **(3, 10)** of nonmagnetic material having a thickness simulating the air gap of the dynamo electric machine located adjacent one of said portions and facing said opening;

cross field simulating winding means **(4; 7*a*, 7*b*, 7*c*; 8*a*, 8*b*, 8*c*)** located on one of said portions of the gauge adjacent the ends, in circumferential direction, of the magnet segment **(2)**;

means **(S)** energizing said cross field simulating winding means to establish a magnetic field simulating the cross field arising in operation of a dynamo electric machine;

a chorded measuring coil **(5, 6, 11)** located on the gauge to sense magnetic flux passing through the non-magnetic material simulating the air gap, the coil being positioned to conform at least approximately to the pitch angle of the armature of the dynamo electric machine in which the segmental permanent magnet **(2)** is to be used;

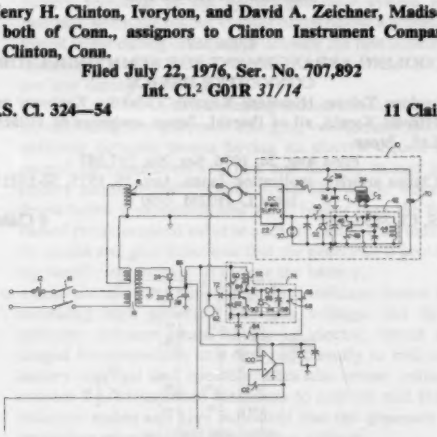
and measuring means including an integrator **(I)** and a volt meter **(21)** connected to the output of the integrator, the integrator being connected to the measuring coil **(5, 6; 11)** whereby the volt meter will read the time integral of voltage induced in the measuring coil upon change of flux linkages between the measuring coil and the magnet segment **(2)**.

4,056,771

REMOTELY CONTROLLED HIGH POTENTIAL INSULATION TESTER

Henry H. Clinton, Ivoryton, and David A. Zeichner, Madison, both of Conn., assignors to Clinton Instrument Company, Clinton, Conn.

Filed July 22, 1976, Ser. No. 707,892
Int. Cl.² G01R *31/14*
U.S. Cl. 324—54 **11 Claims**



1. A high potential d.c. insulation tester for testing insulation on a conductor at a first station within a rotating environment for detection at a second remote station in a non-rotating environment comprising:

a high potential d.c. power supply at the first station having first and second output terminals between which a high potential is produced;

a testing electrode connected to the first output terminal for applying a high potential from the power supply to the insulation under test;

current sensitive means also at the first station connected

with an output terminal of the power supply and having a low voltage output producing a signal indicative of current flowing between the output terminals of the power supply;

detection means at the second station responsive to the signal from the current sensitive means for detecting current from the d.c. power supply; and

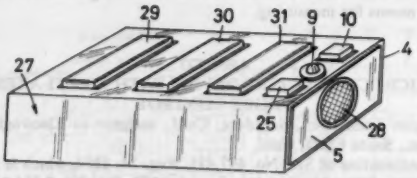
rotatable electrical coupling means connected between the current sensitive means and the detecting means for receiving the low voltage output signal at the first station within the rotating environment and transmitting the signal to the second station in the non-rotating environment.

4,056,772

ION DETECTOR

Constantin Graf von Berckheim, Friedrichstrasse 9, Weinheim, Germany (6940)

Filed Feb. 24, 1976, Ser. No. 660,956
Claims priority, application Germany, Mar. 6, 1975, 2509766
Int. Cl.² G01R *31/02*
U.S. Cl. 324—72 **11 Claims**



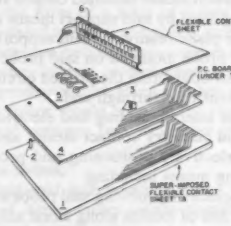
1. Remote control ion detector and controller for a remotely spaced controllable ion generator comprising a space charge detector having a sensing electrode which detects the presence of a space charge by the charging of the sensing electrode, an evaluating circuit contained in a housing consisting essentially of insulating material and bearing the said sensing electrode externally, wherein the sensing electrode is in the form of a surface electrode extending along a wall of said housing, indicator means for indicating the presence or absence of ions and an ultrasonic remote control device for controlling the ion generator as a result of the indication by the indicator means.

4,056,773

PRINTED CIRCUIT BOARD OPEN CIRCUIT TESTER

Donald F. Sullivan, 115 Cambridge Road, King of Prussia, Pa. 19406

Filed Aug. 25, 1976, Ser. No. 717,512
Int. Cl.² G01R *31/02*
U.S. Cl. 324—73 PC **17 Claims**



1. The method of testing printed circuit assemblies before mounting of components comprising the steps of,

1. providing two access terminals for at least one conductor on the assembly to be tested at two spaced positions appearing on the assembly, preferably the extremity positions of all conductors,

2. registering by means of a printed circuit overlay respective electrical test circuit contactors on at least one side of said assembly with respective ones of said access terminals, and

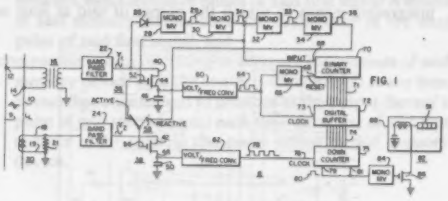
3. testing the continuity of the conductor through the two test circuit contactors with a movable probe incorporating a conductive circuit completing a continuity testing circuit path between the two said contactors on said overlay.

4,056,774

ELECTRONIC WATTHOUR METER CIRCUIT

Lanson Y. Shum, Delmont, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1976, Ser. No. 736,797
Int. Cl.² G01R *21/06*
U.S. Cl. 324—142 **10 Claims**



1. An electronic watthour meter circuit responsive to the voltage and current components of an AC electrical energy quantity to be measured, said circuit comprising:

means producing a first sinusoidal voltage signal in response to said voltage conponent;

means producing a second sinusoidal voltage signal in response to said current component;

means producing a sampling pulse in response to each cycle of said first voltage signal;

sampling means controlled by said sampling pulse for sampling said first and said second voltage signals during each cycle thereof;

voltage-to-frequency converter means producing first and second pulse trains each having a frequency responsive to the sampled values of said first and said second voltage signals, respectively;

binary counter means having a counter input, a reset input, and binary outputs, said counter input receiving said sampling pulse and said reset input receiving said first pulse train such that said output produces a binary output inversely proportional to the sampled value of said first voltage signal during each cycle of said first voltage signal; and

down binary counter means having data inputs, a clock input and a borrow output, said data inputs receiving said binary counter outputs, said clock input receiving said second pulse train such that said borrow output produces pulses responsive to the sampled values of said second voltage signal divided by the inverse values of the sampled values of said first voltage signal, whereby said borrow output pulses are representative of the electrical energy quantity to be measured.

4,056,775

ELECTRONIC KWH METER HAVING INTERNAL POWER SUPPLY AND ERROR CORRECTION SYSTEM

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,800
Int. Cl.² G01R *11/32*
U.S. Cl. 324—142 **10 Claims**

1. An electronic kWh meter for metering electrical energy in a system comprising

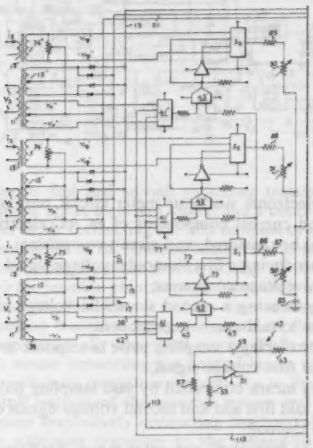
means for generating at least a first analog signal representa-

tive of a voltage in said system and at least a second analog signal representative of a current in said system;

at least one multiplier for producing an output signal representative of the product of said first and second analog signals, said multiplier comprising means for generating a cyclicly varying reference signal;

comparator means for linearly superimposing said reference signal and said first analog signal to form a pulse train which is width modulated in accordance with the comparison of said reference signal with said first analog signal, a switching means responsive to said pulse train for coupling said second analog signal to the output of said multiplier to form an output pulse train representative of the instantaneous power which is width modulated in accordance with the first analog signal and amplitude modulated in accordance with the second analog signal;

integrating means to which the output of said at least one



multiplier is connected for forming an output representative of the average total system energy consumed;

means for converting said average total system power output signal of said integrating means into a series of output pulse signals wherein each pulse is representative of a quantized amount of electrical energy;

means for accumulating said pulses representative of quantized amounts of electrical energy;

means for generating a display proportional to the accumulated quantized amounts of the electrical energy;

power conversion means responsive to said voltage of said system for generating at least one D.C. power supply signal, said power supply signal driving the active circuit components of said meter; and

error correction means responsive to the output pulses of said converter for reversing the phase of said first analog signal connected to said comparator to thereby correct integration errors in said meter.

4,056,776

COMBINATION OF A THYRISTOR CONNECTION AND A TEST DEVICE

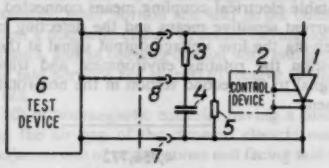
Karl Erik Olsson, and Bengt Sehman, both of Ludvika, Sweden, assignors to ASEA Aktiebolag, Vasteras, Sweden

Filed Dec. 11, 1975, Ser. No. 639,805
Claims priority, application Sweden, Dec. 12, 1974, 7415574
Int. Cl.[2] G01R *31/22, 31/02*
U.S. Cl. 324—158 SC **8 Claims**

1. A combination comprising:

a plurality of serially connected thyristor devices, each said thyristor device including a voltage divider and each voltage divider being parallelly connected to an associated thyristor in each of said thyristor devices;

a test device for testing the individual thyristors in place in the serially connected thyristor devices and including a voltage source and means for measuring the leakage current in an individual thyristor; and



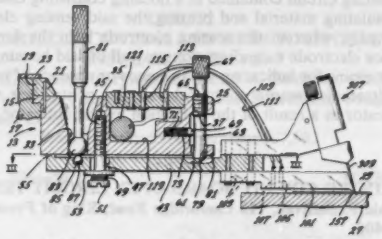
said voltage divider of each thyristor device including first connection means for removable connection of said voltage source across at least a part of said voltage divider, a measuring section connected in series with said at least part of said voltage divider and second connection means for removable connection of said measuring section to said means for measuring.

4,056,777

MICROCIRCUIT TEST DEVICE WITH MULTI-AXES PROBE CONTROL

Jacques Leon Roch, San Jose, Calif., assignor to Electroglas, Inc., Santa Clara, Calif.

Continuation of Ser. No. 497,471, Aug. 14, 1974, which is a division of Ser. No. 366,421, June 4, 1973, Pat. No. 3,851,249.
This application June 16, 1976, Ser. No. 696,512
Int. Cl.[2] G01R *31/02, 1/06*
U.S. Cl. 324—158 P **22 Claims**



1. A device for testing printed circuitry comprising

support means,

electrical connection means mounted on said support means,

a probe arm supported by said support means for movement in a particular plane relative to said support means,

at least one test probe mounted on said probe arm having means thereon for contacting the printed circuitry for transmitting a current therethrough and

conductor means interconnecting said electrical connection means and said circuitry contact means, and

apparatus for selectively positioning said probe relative to said supporting means including

first means for selectively moving said probe arm in substantially a single line of motion along a first axis transverse to the printed circuitry being tested and

second means for selectively moving said probe arm substantially universally in the particular plane substantially parallel to said printed circuitry,

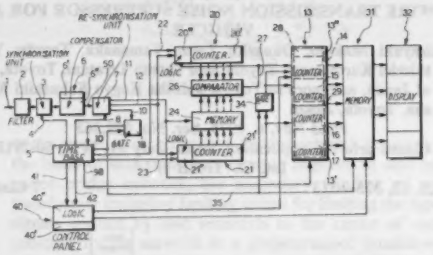
the first means including third means on the probe arm near one end of the probe arm and extending through the support means and engaging the probe arm for providing a fulcrum for rotary movement of the probe arm relative to the support means in the particular plane and for pro-

viding an adjustment of the probe arm relative to the support means along the first axis and the second means including fourth means extending through the support means to the probe arm and operable to provide a movement of the probe arm in the particular plane relative to the support means in accordance with such operation and the first means further including fifth means operatively coupled to the support means and the probe arm at a position between the third means and the fourth means to bias the probe arm toward the support means and to control the disposition of the third means relative to the probe arm along the first axis.

4,056,778
DIGITAL TACHOMETER

Gaspare Randazzo, Turin, Italy, assignor to Societa di Elettronica per l'Automazione - SEPA S.p.A., Turin, Italy

Filed Sept. 13, 1976, Ser. No. 722,462
Claims priority, application Italy, Sept. 23, 1975, 69357/75
Int. Cl.² G01P *3/48*
U.S. Cl. 324—166 **8 Claims**



1. A digital tachometer for determining and displaying the speed of rotation of a rotating device by counting pulses derived from an electrical sensor signal produced by a sensor sensitive to the speed of rotation of the device, the frequency of said sensor signal being a function of the speed of rotation of the device, comprisings:

means for deriving from said sensor signal a first electrical signal in the form of a train of pulses the pulse repetition frequency of which is variable and directly related by a predetermined scale factor to the instantaneous frequency of said sensor signal,

main counting means,

means feeding said processing means with said first signal,

processing means,

means feeling said processing means with said first signal, said processing means operating to produce a second signal in the form of a train of pulses the frequency of which is related to said first signal is such a way that in any interval between two successive pulses of said first signal the frequency of said second signal is that frequency at which a predetermined given number of pulses equal to said scale factor would occur in the immediately preceding interval between two successive pulses of said first signal,

interpolation means,

means feeding said interpolation means with said second signal, said interpolation means operating to count the pulses of said second signal,

a time base circuit which generates a signal controlling the operation of said main counting means whereby to define successive counting intervals during which said main counting means count the pulses of said first signal,

memory means,

means feeding said memory means with a signal representing the content of said main counting means accumulated during the last complete counting interval together with the content of said interpolation means accumulated between the last pulse of said first signal and the end of said counting interval, and

display means operating to display the content of said memory means,

said processing means comprising:

first and second counters,

means feeding said first and second counters with respective counting signal, the frequency of the signal fed to said first counter being greater than the frequency of the signal fed to said second counter by a factor equal to the said scale factor,

a memory device,

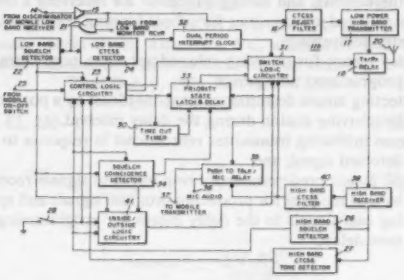
means feeding the output of said second counter to said memory device under the control of said first signal whereby the count accumulated in said second counter between two successive pulses of said first signal is stored in said memory device until the occurrence of the next pulse of said first signal, and

comparator means operating to compare the contents of said memory device with the contents accumulated at any time in said first counter and to produce at the output thereof a pulse of said second signal each time the count of said first counter is the same as the count stored in said memory device.

4,056,779
VEHICULAR REPEATER

Robert Lee Toler, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 5, 1976, Ser. No. 673,841
Int. Cl.² H04B *7/20*
U.S. Cl. 325—4 **23 Claims**


AUDIO FROM LOW BAND MONITOR RCVR
DUAL PERIOD INTERRUPT CLOCK
LOW BAND SQUELCH DETECTOR
LOW BAND CTCSS DETECTOR
CONTROL LOGIC CIRCUITRY
PRIORITY STATE LATCH & DELAY
TIME OUT TIMER
SQUELCH COINCIDENCE DETECTOR
PUSH TO TALK / MIC. RELAY
MIC AUDIO
TO MOBILE TRANSMITTER
INSIDE / OUTSIDE LOGIC CIRCUITRY
HIGH BAND CTCSS FILTER
HIGH BAND RECEIVER
HIGH BAND SQUELCH DETECTOR
HIGH BAND CTCSS TONE DETECTOR

1. In a two-way communication system having a base station operating on a first frequency, and a plurality of vehicular installations each comprised of a mobile station operating on the first frequency, a detachable portable unit operable on a second frequency and a repeater unit for repeating out on one of said frequencies information received on the other of said frequencies, apparatus for prioritizing the repeater operation, including in combination:

first detect means for detecting received transmissions on the first frequency;

second detect means for detecting received transmissions on the second frequency;

switching means for activating one of the receive and transmit functions at the second frequency;

means coupled to the switching means for providing momentary interrupt periods in the repeater function when repeating out on the second frequency;

latching means coupled to the switching means for enabling the repeater function;

first circuit means coupled to the first and second detect means to the latching means for delatching the latching means when substantially simultaneous transmissions are received on the first and second frequencies during at least one of said interrupt periods;

delay means for relatching the latching means a predeter-

mined period of time after the detection of received transmission;

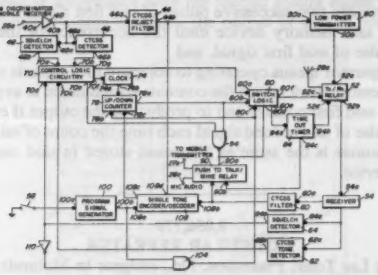
second circuit means for disenabling repeating out on the second frequency when transmission is received on the second frequency during at least one of said interrupt periods.

4,056,780

VEHICLE REPEATER PRIORITIZATION SYSTEM

Thomas Edward Faulkner, Margate, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 25, 1975, Ser. No. 590,006
Int. Cl.[2] H04B *1/40, 7/14*
U.S. Cl. 325—5 **33 Claims**



1. In a two way communication network, an improved vehicular repeater adapted to operate in the vicinity of other repeaters and arranged to cooperatively assign repeating priorities thereamong, and having a receiver for receiving a broadcast signal and a transmitter for rebroadcasting said signal, the repeater comprising:

delay means for delaying rebroadcast for a predetermined programmed time period,

detecting means detecting a signal broadcast by a potentially interferring station during the delay interval,

means inhibiting transmitter rebroadcast in response to said detected signal, and

logic means predeterminedly responsive to signals received by said receiver for producing program signals and applying said signals to the delay means for programming the time delay.

4,056,781

DEVICE FOR CALLING A GROUND STATION BY AN AIRCRAFT

Albert Hetebrij, and Cornelis Adrianus Geertrudis Kloeck, both of Bussum, Netherlands, assignors to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Continuation-in-part of Ser. No. 502,170, Aug. 30, 1974, abandoned. This application Sept. 20, 1976, Ser. No. 724,922
Int. Cl.[2] H04B *1/00, 3/60*
U.S. Cl. 325—55 **13 Claims**

1. A ground station system for automatically monitoring radio communication calls from aircraft which transmit and receive traffic over one of a predetermined number of high frequency carriers, comprising:

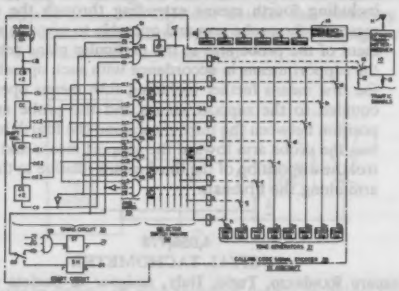
I. in said aircraft:

A. means for transmitting from said aircraft a calling code signal of tone frequencies of given spacing and duration indicating in its code the ground station to be called, and

II. at said ground station:

A. separate receivers tuned to all of said high frequency carriers,

b. decoding means connected to all of said receivers for completely and correctly receiving the calling code signal for said ground station over any one of said carriers, and



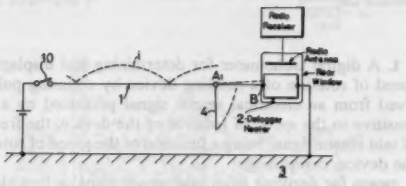
C. means for transmitting traffic signals over said one high frequency carrier upon which said calling code signal was detected by said decoding means.

4,056,782

WIRE TRANSMISSION NOISE SUPPRESSOR FOR A VEHICLE

Takayuki Makino, Okazaki; Teruo Yamanaka, Toyota; Yoshitaka Kuroyanagi, Toyota, and Tatsuo Teratani, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 6, 1975, Ser. No. 629,363
Claims priority, application Japan, July 31, 1975, 50-29180
Int. Cl.[2] H04B *1/18*
U.S. Cl. 325—313 **7 Claims**



1. A wire transmission noise suppressor for a vehicle including an electrical circuit wherein a standing wave of current is formed, comprising a branch circuit of low impedance connected to said electrical circuit at a position corresponding to a node of a standing wave, said branch circuit being a noise trap wire having an open circuit end and a length of about

$$\lambda/4 + \lambda 2 \times n, \ (n = 0, 1, 2 \ldots),$$

wherein the current is a high frequency signal and λ is the wavelength of the signal, said noise trap wire being arranged along said electrical circuit toward the side from which the high frequency current is generated.

4,056,783

LINEAR SOUND AMPLIFIER CIRCUIT

Stanley Norman Harrison, Dupont, Colo., assignor to AudioKinetics Corporation, Denver, Colo.

Continuation of Ser. No. 640,329, Dec. 12, 1975, abandoned. This application Feb. 3, 1977, Ser. No. 765,117
Int. Cl.[2] H03F *3/18*
U.S. Cl. 330—268 **3 Claims**

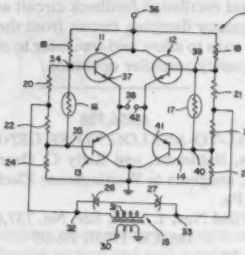
1. A linear sound amplifier circuit for increasing fidelity and boosting power output from a sound source in the form of a stereophonic tape or record player and the like, the circuitry comprising in combination:

a balanced bridge network including a series of NPN transistors and PNP transistors, the collectors of each PNP tran-

sistor connected to ground, and the emitter of a first NPN transistor connected directly to the emitter of a first PNP transistor to form one segment of said balanced bridge network and the emitter of a second NPN transistor directly connected to the emitter of the second PNP transistor to form the second segment of said balanced bridge network;

a resistive divider network at the power input of each segment of said balanced bridge network, the base of each said NPN transistor connected to the base of each said transistor in each segment by means of said resistor divider network;

a transformer having a primary winding connected to the input signal from said sound source, a secondary winding having opposite terminals with each terminal connected



to the center of each resistive divider network connecting the bases of said transistors in each segment of said balanced bridge network, the secondary winding of said transformer including limiting means for limiting the input signals applied by said terminals to the center of each resistive divider network to a predetermined breakdown voltage value;

a DC voltage supply terminal adapted for connection to a DC voltage supply means with the collectors of each NPN transistor connected to said terminal; and

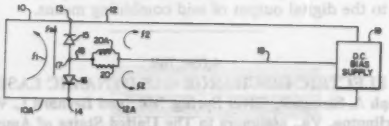
a common output including a first output terminal connected to the emitters of said first NPN and PNP transistors and a second output terminal connected to said emitters of said second NPN and PNP transistors, said first and second output terminals providing the signal output for transmission thereof to a resistive load.

4,056,784

SUPPRESSION OF PARAMETRIC OSCILLATIONS IN IMPATT AMPLIFIERS AND OSCILLATORS

Marvin Cohn, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 4, 1976, Ser. No. 738,811
Int. Cl.[2] H03F 3/10
U.S. Cl. 330—287 **12 Claims**



1. A balanced circuit for suppressing parametric oscillations in IMPATT apparatus that includes avalanche devices, comprising:

a balanced transmission line for propagating a broadband of frequencies including odd harmonics of a large-signal input frequency and a parametrically-generated idler signal having odd symmetry,

an unbalanced transmission line for propagating a broadband of frequencies including even harmonics of a large-signal input and a parametrically-generated idler signal having even symmetry,

at least one pair of avalanche devices in an anti-series arrangement electrically connected at the junction of the balanced and the unbalanced transmission lines,

said unbalanced transmission line having a central branch connected to the anti-series arrangement at its common terminal,

a constant current d-c power supply in the unbalanced transmission line for biasing the avalanche devices to operate in the avalanche condition,

a frequency-independent resistive loading in the unbalanced transmission line to overcome negative resistance parametrically generated in the avalanche devices when a large-signal input is impressed across the devices operating in the avalanche condition, to suppress the parametrically-generated idler signal of even symmetry in the unbalanced transmission line and to simultaneously suppress the parametrically-generated idler signal of odd symmetry in the balanced transmission line, and

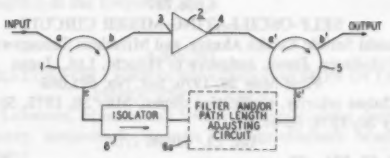
an inductance, connected across the resistive loading, having a impedance greater than that of the resistive loading at the lowest anticipated frequency and providing minimum shunting resistance to the d-c bias current.

4,056,785

LOW-NOISE MICROWAVE AMPLIFIER

Clarence Burke Swan, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1976, Ser. No. 747,899
Int. Cl.[2] H03F 3/60
U.S. Cl. 330—53 **7 Claims**



1. A microwave amplifier comprising:

an input microwave circulator having in the direction of circulation a first, second and third port;

an output microwave coupling device having at least a first, second and third port;

means for coupling an input signal to the first port of said input circulator;

means for deriving an output signal from the second port of said output device;

an amplifying stage having an input terminal and an output terminal;

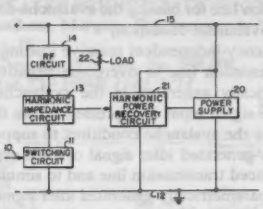
means for coupling said amplifying stage between the second port of said input circulator and the first port of said output device; and

a passive signal by-pass arrangement coupled between the third ports of said input circulator and output device such that only under unpowered or otherwise failed condition of said amplifying stage said input signal is reflected at said input terminal and coupled to said output terminal via said input circulator, said passive by-pass arrangement and said output coupling device thereby reducing transmission loss of the amplifier.

4,056,786
SINGLE ENDED CLASS D AMPLIFIER

Heber J. Morrison, Ellicott City, and Rockney W. Howland, Glen Burnie, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 502,316, Sept. 3, 1974, abandoned. This application Aug. 16, 1976, Ser. No. 714,923
Int. Cl.[2] H03F 3/04
U.S. Cl. 330—207 A 3 Claims



1. A class D amplifier circuit for amplifying an RF input signal, comprising in combination:

a. an on-off switching circuit responsive to said RF input such that said switching circuit alternatively switches to produce high and low conductivity states between two terminals of said switching circuit;

b. a harmonic circuit; and

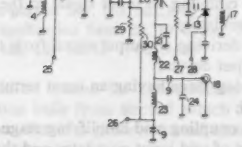
c. an RF circuit, wherein:

d. said switching circuit, harmonic circuit and RF circuit are series coupled to the positive and negative terminals of a DC power supply to form a Class D amplifier for producing an output signal having a frequency equal to the fundamental frequency of said input signal and an amplitude substantially proportional to the duty cycle of said input signal, said harmonic circuit storing energy when said switching circuit is in the high conductivity state and returning said stored energy to said power supply during the low conductivity state of said switching circuit.

4,056,787
SELF-OSCILLATING MIXER CIRCUIT

Takeshi Saitoh; Eisaku Akutsu, and Mitsuhisa Shinagawa, all of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed May 28, 1976, Ser. No. 691,086
Claims priority, application Japan, May 30, 1975, 50-64266; May 30, 1975, 50-64267
Int. Cl.[2] H04B 1/06
U.S. Cl. 331—59 4 Claims



1. A self-oscillating mixer circuit comprising:

a first input terminal;

a first switching diode connected to said first input terminal at one end thereof;

a self-oscillating mixing transistor connected at its emitter to the other end of said first switching diode and grounded at its base;

a feedback circuit for oscillation connected between the collector of said transistor and said one end of the first switching diode;

an intermediate frequency damping circuit connected between said input terminal and ground;

a second input terminal connected to said other end of the first switching diode;

a first bias voltage source connected to said one end of the first switching diode, for rendering said first switching diode conductive and nonconductive;

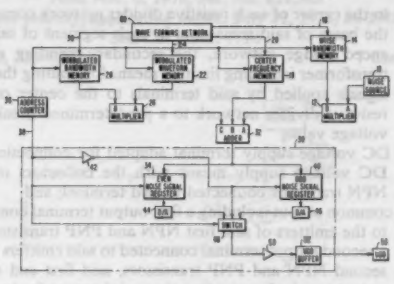
means for rendering said first switching diode conductive by applying a voltage of said first bias voltage source to said first switching diode so as to allow said transistor to effect a self-oscillating mixing operation; and

means for rendering said first switching diode nonconductive by changing the voltage of said first bias voltage source applied to said first switching diode, and disconnecting said oscillation feedback circuit and said intermediate frequency damping circuit from the emitter of said transistor so as to allow said transistor to effect an intermediate frequency amplifier operation.

4,056,788
DIGITAL-TO-ANALOG NOISE GENERATOR

Joel E. Brown, Baltimore, and Kelly C. Overman, Pikesville, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1976, Ser. No. 737,820
Int. Cl.[2] H03B 29/00
U.S. Cl. 331—78 23 Claims



1. A digital noise signal generator comprising:

first means for generating a noise product signal in response to a noise bandwidth input signal and a random noise signal;

second means for generating a wobbulated waveform product signal in response to a wobbulated bandwidth input signal, and a wobbulated waveform input signal;

means for combining the noise product signal and the wobbulated waveform product signal in response to the output of said first and second generating means; and

third means for generating an analog noise signal in response to the digital output of said combining means.

4,056,789
ELECTRIC DISCHARGE GAS DYNAMIC LASER

Joseph A. Stregack, Silver Spring, Md., and Bernard L. Wexler, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 2, 1976, Ser. No. 693,592
Int. Cl.[2] H01S 3/00
U.S. Cl. 331—94.5 G 18 Claims

1. A CW laser system which comprises:

a housing,

said housing including a plenum section, a nozzle array section, and a constant area supersonic flow region,

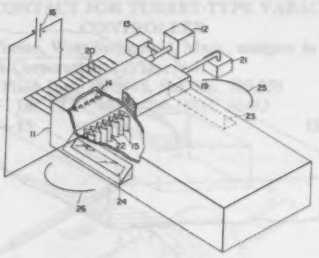
said plenum section including gas inlet for introducing an intermediate gas, and a plurality of conductive pins, said

conductive pins extending axially toward said array and connected electrically to a dc power supply,

said nozzle array section including a plurality of side-by-side noncontoured wedge shaped nozzles positioned to form a nozzle throat therebetween and connected electrically to ground,

said nozzles including a plurality of gas outlet openings along their height downstream from the throat through which a lasing gas flows, and an inlet through which said lasing gas enters said nozzles;

a plenum chamber to which each of said nozzle inlets are connected for supplying said lasing gas to said nozzles;



a pump for pumping gases along the length of said housing from said plenum section and said nozzles;

oppositely disposed windows in said housing extending downstream from the plane of said nozzle throat and positioned at Brewster's angle along the supersonic flow region; and

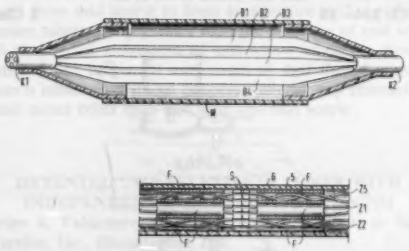
a fully reflective spherical mirror opposite one window and a partially reflective mirror opposite the other window, whereby an optical cavity whose axis is transverse to the gas flow is formed between said mirrors and said mirrors are axially movable along the length of said windows.

4,056,790

TRANSMISSION SYSTEM FOR PULSE SIGNALS

Reginhard Pospischil, Lochham, and Josef Dömer, Hohenschaftlarn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 425,162, Dec. 17, 1973, abandoned.
This application July 24, 1975, Ser. No. 598,724
Claims priority, application Germany, Dec. 18, 1972, 2261840
Int. Cl.² H04B 3/30
U.S. Cl. 333—5 **7 Claims**



1. A transmission system for pulse modulation signals such as pulse code modulation signals comprising a plurality of cables that are spliced together end to end and wherein each cable contains a plurality of group conductors and each group conductor contains a plurality of pairs of conductors and wherein different group conductors are utilized for forward and reverse transmission, wherein a plurality of inductances comprising ferrite tubes have openings through which individual ones of said pairs of conductors extend, each of said group conductors surrounded by a shielding cover, and each of said ferrite tubes spaced on said pair of conductors and having a length and cross section which depends on the properties of the ferrite material and have an inductance value L with respect to unsymmetrical conductor currents which approximately are defined by the following equation:

$$L = \frac{Z}{m \cdot \pi \cdot F_2 \cdot (1 + \frac{1}{N})} \left[4 \left(\frac{f_2}{f_1} \right)^2 \cdot \frac{l_2}{l_1} \cdot 10^{\frac{a_{f_1} - a_1 - 2(n + a_{u_1} - a_{u_2}) - (a_{u_2} - a_2)}{10}} - 1 \right]^{\frac{1}{2}}$$

where:

Z = Wave resistance for the unsymmetric wave type

m = Number of places of insertion of tubular bi-filar inductances in a continuous conductor path of length l_2

l_1 = Reference lengths

f_1 = Reference frequency

f_2 = Highest frequency to be transmitted, whereby the cross-talk demands must be considered

N = Number of pairs of a group

n = 10 lg N

a_{f_1} = direct cross-talk at the frequency f_1 via the conductor length l_1

a_1 = Operational damping of the symmetrically operated pair at the frequency f_1 via the conductor length l_1

a_{u_1} = Damping of the interference from the ground-symmetric into the ground unsymmetric wave type at the frequency f_1 of a pair via the conductor length l_1

a_{u_1} Operative attenuation for ground-unsymmetric transmission through a pair over the section length l at the frequency f_1

a_{u_2} = Operative attenuation for ground-unsymmetric transmission through a pair over the section length l_2 at the frequency f_2

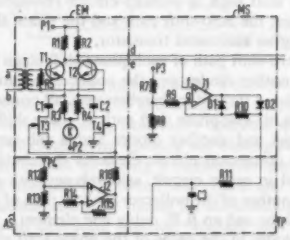
a_2 = Operative attenuation through a pair over the section length l_2 at the frequency f_2.

4,056,791

APPARATUS FOR CORRECTING DISTORTION IN LOW FREQUENCY CABLE

Reiner Lohmann, Munich, and Volker Ludwig, Gelting, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 30, 1975, Ser. No. 627,264
Claims priority, application Germany, Oct. 31, 1974, 2451912
Int. Cl.² H04B 3/04
U.S. Cl. 333—18 **4 Claims**



1. Apparatus for equalizing the attenuation characteristic in audio frequency cable connected for carrying a base band signal from a transmitter to a receiver comprising:

measuring circuit means for producing a measuring signal

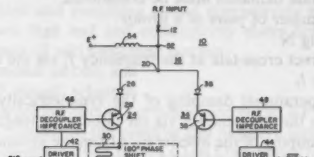
having a value which is dependent on the peak value of said base band signal in the region of said receiver and differential amplifier means in said receiver comprising first and second amplifier elements, the conductive paths of which are, respectively, connected in series with a gain control means comprising a capacitance connected in series with the drain-source path of a field effect transistor, said gain control means being responsive to said measuring signal such that said audio frequency cable and said differential amplifier means together exhibit a substantially constant attenuation characteristic within a predetermined low frequency range.

4,056,792

WIDEBAND DIODE SWITCHED MICROWAVE PHASE SHIFTER NETWORK

Stuart S. Horwitz, Baltimore, Md., and Walter R. Jost, Richfield, Minn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 11, 1975, Ser. No. 630,872
Int. Cl.² H01P *1/18, 1/15, 5/12;* **H03K** *17/74*
U.S. Cl. 333—31 R **18 Claims**



1. A diode switched variable R.F. phase shift network of the type in which shift increment stages may be controllably inserted in series circuits in the network in response to normal and complemented forms of binary digit signals, said phase shift network comprising:

a. at least first and second phase shift stages, all serially connected between first and second network ends,

b. each phase shift stage comprising a zero-shift path and a phase shift path in parallel circuit relationship with one another, the zero-shift path and the phase shift path each having an associated transistor,

c. the zero-shift path of each phase shift stage including one and another diodes and the collector-emitter path of the associated transistor therebetween, all connected in series circuit, d. The phase shift path of phase shift stage including one and another diodes and a sub-network of two series connected circuit elements therebetween, all connected in series circuit, said sub-network including one and another of the collector-emitter path of the associated transistor and an R.F. delay line element,

e. the diodes in the paths of the phase shift stages having a common polarity of forward conduction relative to the first and second network ends, and means for applying a bias potential between said first and second network ends, said bias potential being poled in the direction of forward conduction of the diodes,

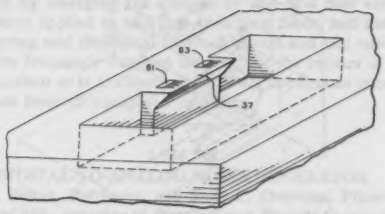
f. means for applying the normal and complemented forms, respectively, of each binary digit signal to the bases of the transistors associated with one and the other paths of the corresponding phase shift stage.

4,056,793

ACOUSTIC WAVEGUIDE RESONATOR

Robert S. Wagers, Richardson, and Clinton S. Hartmann, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 451,718, March 15, 1974, Pat. No. 3,974,464. This application May 12, 1976, Ser. No. 685,551
Int. Cl.² H03H *9/04, 9/26, 9/30;* **H01L** *41/18*
U.S. Cl. 333—72 **9 Claims**



1. An acoustic waveguide resonator comprising:

a substrate made of a material taken from the group consisting of single crystal silicon and single crystal piezoelectric material;

a horizontal ledge extending out from said substrate with the top of the ledge being coplanar with the top surface of said substrate, said substrate and said ledge defining an acoustic waveguide and being shaped so as to be a resonant structure; and

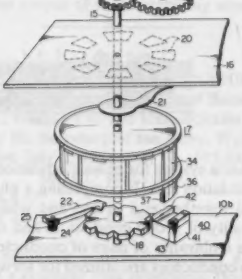
at least one transducer on said waveguide for exciting acoustic waves therein, having a transducer pad with a plurality of electrode fingers extending laterally therefrom toward the edge of said ledge.

4,056,794

CHANNEL SELECTION MECHANISM FOR AN ELECTRONIC TUNER

Tugio Ohigashi, and Junichi Ariga, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 24, 1976, Ser. No. 699,594
Claims priority, application Japan, June 25, 1975, 50-79603
Int. Cl.² H03J *3/18, 1/02*
U.S. Cl. 334—15 **5 Claims**



1. A channel selection mechanism for an electronic tuner having a varactor, comprising, a motor-driven shaft, a plurality

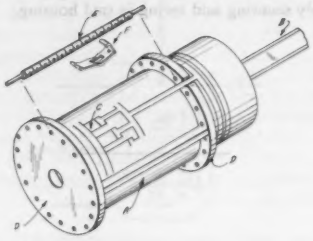
of contact elements connected to sources of different potentials, a wiper mounted on the shaft to slidably make contact with each contact element to selectively connect said different potentials to the varactor of the electronic tuner, a channel number indicating drum having a plurality of slots in pairs on the periphery thereof and film strips equal in number to said pairs inserted into said slots, and electromagnetic sensing and switch means mounted stationary relative to the periphery of said drum to detect the proximity thereto of a particular one of said film strips to permit said electronic tuner to switch between the VHF and UHF bands.

4,056,795

WIPER CONTACT FOR TURRET-TYPE VARACTOR CONTROLLER

Robert D. Whelan, West Springfield, Mass., assignor to General Instrument Corporation, Clifton, N.J.

Filed June 29, 1976, Ser. No. 700,959
Int. Cl.[2] H03J *3/18;* H01C *10/42*
U.S. Cl. 334—15 **13 Claims**



1. A contact for use on a turret-type varactor controller of the type having a resistive strip mounted on the surface of said turret, a screw rotatably mounted on said turret at a location spaced from said strip, said contact being deformable to be inserted between said screw and said strip to assure electrical contact therebetween, said contact comprising thread engaging means and means for inhibiting movement of said thread engaging means relative to said turret surface in a direction tangential to said surface but permitting movement thereof relative to said surface in a direction radial to said surface, said inhibiting means comprising an aperture defined within said contact by said thread engaging means, side portions extending therefrom and a portion connecting said side portions, within which said screw is adapted to be received, said aperture having a tangential dimension substantially equal to the diameter of said screw and said connecting portion being normally spaced from said screw to form an aperture with a radial dimension substantially greater than the diameter of said screw, such that radial movement of said screw engaging means is permitted but tangential movement of said thread engaging means is inhibited, without cooperation with any external part of said turret other than said strip and said screw.

4,056,796

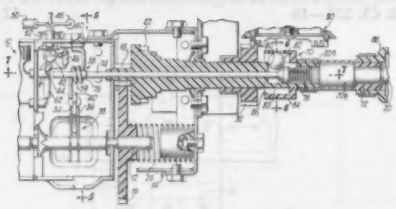
DETENTED UHF TELEVISION TUNER WITH INDEPENDENT INDUCTIVE FINE TUNING

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Oct. 20, 1976, Ser. No. 734,327
Int. Cl.[2] H03J *1/14, 5/06*
U.S. Cl. 334—55 **22 Claims**

1. A UHF television tuning system comprising:

a UHF tuner having a housing, a continuously variable main tuning shaft rotation of which is effective to cause said tuner selectively to select signals on all channels in the UHF television band, a channel selector shaft, means interconnecting said channel selector shaft and said main tuning shaft, a fine tuning shaft associated with said channel selector shaft, detent means for said selector shaft for establishing a stop position of said main tuning shaft for each of the television channels in the UHF band, a mechanically variable capacitor mechanically coupled to said main tuning shaft, a variable frequency oscillator electrically coupled to said mechanically variable capacitor and having a frequency of oscillation that is adjustable upon rotation of said main tuning shaft over a range of frequencies predeterminedly related to the range of frequencies of the entire UHF television band for determining the frequency of the signal received by said UHF tuner, said variable frequency oscillator having a mechanically variable inductor electrically connected thereto; and



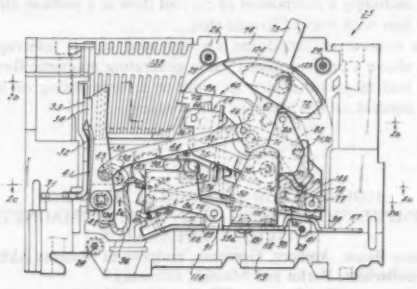
means mechanically coupling said variable inductor to said fine tuning shaft for controlling the frequency of said oscillator to tune said tuner independently of the operation of said main tuning shaft over a range of frequencies corresponding to substantially less than the frequency range provided by said mechanically variable capacitor for fine tuning said UHF tuner.

4,056,797

CRADLE FOR CONTACT OPERATING MEANS

Tadeusz J. Rys, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed July 6, 1976, Ser. No. 702,891
Int. Cl.[2] H01H *75/00, 77/00*
U.S. Cl. 335—6 **10 Claims**



1. A circuit breaker pole unit including a narrow insulating housing, cooperating movable and stationary contact means disposed within said housing, a manually operable spring powered operating mechanism for opening and closing said contact means; said mechanism including a releaseable cradle, a collapsible toggle interposed between said cradle and said movable contact means, and latch means for maintaining said cradle latched in an operating position wherein said operating mechanism is operable to close said contact means; automatic means for tripping said latch means responsive to predetermined abnormal current conditions thereby releasing said cradle whereby said contact means are opened by said mechanism; a metal frame within said housing; pin means pivotally mounting said cradle on said frame; said cradle including first and second spaced parallel walls, one of which has an exten-

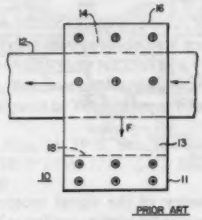
sion engageable by said latch means; said walls on their confronting surfaces having integral bearing formations which pivotally support said toggle.

4,056,798

CURRENT LIMITING CIRCUIT BREAKER

Franklin S. Malick, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 23, 1975, Ser. No. 615,858
Int. Cl.[2] H01H *77/10*
U.S. Cl. 335—16 **12 Claims**



PRIOR ART

1. A circuit interrupter, comprising:
a pair of separable contacts;
means supporting said separable contacts and operable to actuate said contacts between open and closed positions to interrupt current flow therebetween; and
a magnetic drive structure comprising a magnetic device comprising a plurality of slotted plates of magnetic material forming an elongated slot having a top and a bottom, said slotted plates being electrically insulated from each other and being spaced apart at unequal intervals to form a plurality of insulating gaps;
said supporting means comprising a contact arm carrying one of said contacts and extending into said slot when said contacts are in a closed circuit position;
the current through said circuit interrupter when in a closed circuit position passing through said contact arm and including a component of current flow in a vertical direction with respect to said slot;
an overcurrent condition through said circuit interrupter above a predetermined value generating magnetic flux in said magnetic device to produce a force acting on said contact arm to separate said contacts.

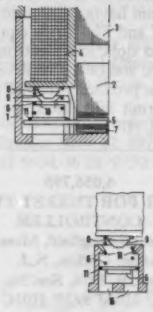
4,056,799

HOUSING FOR SECURING A DAMPING COMPRESSION SPRING IN AN ELECTROMAGNETIC SWITCHING APPARATUS

Johann Bauer, Amberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 3, 1975, Ser. No. 637,403
Claims priority, application Germany, Dec. 5, 1974, 2457608
Int. Cl.[2] H01F *7/08*
U.S. Cl. 335—277 **8 Claims**

1. In an electromagnetic switching apparatus including a housing, a magnet coil and switching and non-switching magnet parts disposed within said housing, and at least one damping compression coil spring for biasig said non-switching magnet part in one direction in said housing, said spring having a plurality of turns of the same diameter, and an end turn having a diameter which is greater than that of said plurality of turns for securing said spring within said housing, the improvement comprising said housing including hook-shaped projection members disposed about the periphery of said spring, said projection members being spaced apart from each other along a diameter of said spring by a distance which is greater than the diameter of said plurality of turns but less than the diameter of said end turn so that said plurality of turns are movable axially



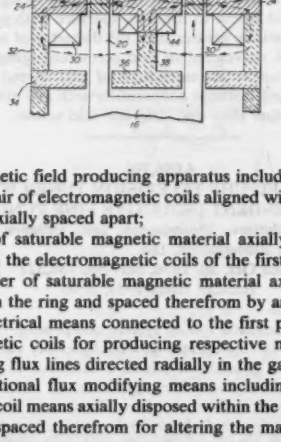
between said members and said end turn engages said members for movably securing said spring in said housing.

4,056,800

MAGNETIC FIELD ALIGNING MEANS

Norman J. Dionne, Arlington Heights, and Ernest C. Wettstein, Acton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 11, 1975, Ser. No. 639,745
Int. Cl.[2] H01F *3/08*
U.S. Cl. 335—296 **10 Claims**



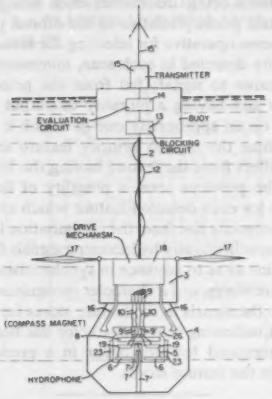
1. Magnetic field producing apparatus including:
a first pair of electromagnetic coils aligned with one another and axially spaced apart;
a ring of saturable magnetic material axially disposed between the electromagnetic coils of the first pair;
a cylinder of saturable magnetic material axially disposed within the ring and spaced therefrom by an annular gap;
first electrical means connected to the first pair of electromagnetic coils for producing respective magnetic fields having flux lines directed radially in the gap; and
unidirectional flux modifying means including electromagnetic coil means axially disposed within the ring and annularly spaced therefrom for altering the magnetic field in the gap.

4,056,801

APPARATUS FOR LOCATING SOURCES OF SOUND IN WATER

Reinhard Leisterer, Bremen; Manfred Oelfke, Achim; Hans Woiczik, Oyten; Hans-Joachim Meyer, and Rolf Ostermeier, both of Bremen, all of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Continuation-in-part of Ser. No. 503,945, Sept. 6, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,405
Claims priority, application Germany, Sept. 8, 1973, 2345381
Int. Cl.[2] G01S 3/80
U.S. Cl. 340—2 **22 Claims**



1. In an apparatus for locating sources of sound in water, including a hydrophone system which is mechanically coupled with a compass magnet (north reference) so that one given reference axis of the hydrophone system is automatically aligned with the magnetic field of the earth, a buoy, and means for suspending the hydrophone system from said buoy, after being dropped into the water; the improvement wherein said means for suspending comprises, in combination:

a control box;

a plurality of thin transmission wires, each of which is insulated with an elastic plastic coating and passes freely through the water, electrically connecting the hydrophones of the hydrophone system to said control box;

an elastic suspending cable and electrical connecting cable extending between said control box and said buoy; and,

means for mechanically connecting said hydrophone system to said control box so that seaid hydrophone system is suspended below said control box and, when operable, is rotatable in a recoiless manner about an axis which is perpendicular to the surface of the earth.

4,056,802

SONAR ALARM SYSTEM

James L. Rabon, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 10, 1976, Ser. No. 665,653
Int. Cl.[2] G01S 9/66
U.S. Cl. 340—3 R **3 Claims**

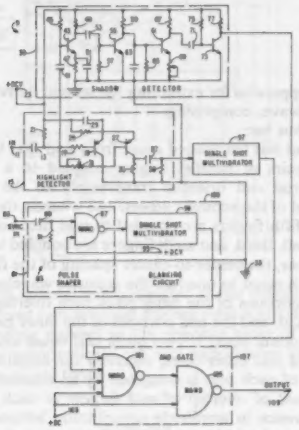
1. In combination with a reflective object detecting sonar system including transmitter means for projecting pulses of sonic energy at predetermined sweep intervals and receiver means for providing first electrical signals representative of reflected sonic energy, a target alarm system comprising:

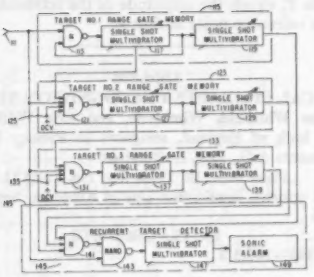
highlight detector means, responsive to said first electrical signals, for providing a second electrical signal corresponding to each highlight reflection of at least a predetermined strength;

shadow detector means, responsive to said first electrical signals, for providing a third electrical signal corresponding to each substantial absence of reflected energy for a predetermined time period;

single shot means, responsive to said second electrical signals, for providing a fourth electrical signal for a predetermined time period after initiation;

coincidence gate means, responsive to coincidence of said second and said fourth electrical signals, for providing fifth electrical signals each representative of a detected highlight reflection followed by a detected shadow, said fifth electrical signals occurring at times in a given sweep





interval corresponding to the ranges of reflective objects giving rise to detected highlights and associated shadows;

range memory means, responsive to occurrences of said fifth electrical signals in a given sweep interval, for initiating sixth electrical signals at times in the following sweep interval corresponding to said ranges; and

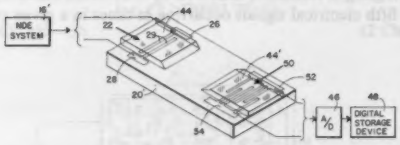
target alarm means, responsive to coincidence of at least one of said fifth signals and a corresponding one of said sixth signals, for providing a perceptible output signal corresponding to detection of a highlight and associated shadow at substantially the same range on at least two successive sweeps.

4,056,803

METHOD AND APPARATUS FOR EXTRACTING DERIVATIVES FROM SURFACE ACOUSTIC WAVES

Richard Manning White, Berkeley, and Tzu-Hwa Hsu, San Jose, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 14, 1975, Ser. No. 632,134
Int. Cl.[2] H04B *11/00*
U.S. Cl. 340—15 8 Claims



1. An apparatus for extracting the second derivative from an acoustic wave, comprising:

a first bus bar;

a second bus bar spaced apart from said first bus bar;

three pairs of parallel fingers coupled to a piezoelectric material and oriented transversely to the direction of travel of the acoustic waves, and wherein the first, fourth, and fifth fingers are coupled to said first bus bar and the second, third, and sixth fingers are coupled to said second bus bar, the center-to-center spacing of the fingers in each pair is equal to one-half the acoustic wavelength, and the end portions of the outer pairs each overlap by an equal amount, and the end portions of the inner pair overlap by an amount equal to two times said equal amount of overlap of said outer pairs, whereby the amplitude contribution of each pair is weighted by an amount equal to the amount of overlap of said fingers in each pair and the difference in amplitude contribution between said outer pairs and said inner pairs is obtained so that the second derivative is extracted from the acoustic wave according to the finite difference approximation of the pulse amplitudes, as follows:

$$\Delta^2 Y_k = Y_k - 2Y_{K-1} + Y_{k-2},$$

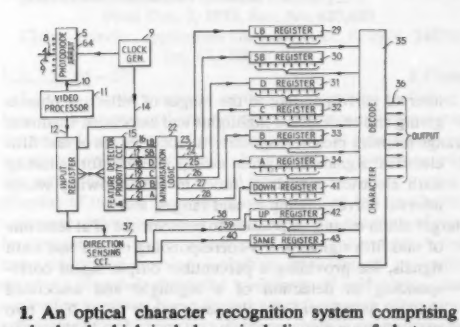
wherein Y_k equals the amplitude of the acoustic wave passing a reference point at time k.

4,056,804

OPTICAL CHARACTER RECOGNITION SYSTEMS

John Alan Whitfield, Wimborne, and Eric William Burdis, Poole, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Sept. 10, 1976, Ser. No. 722,132
Claims priority, application United Kingdom, Sept. 11, 1975, 37346/75
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 J 10 Claims



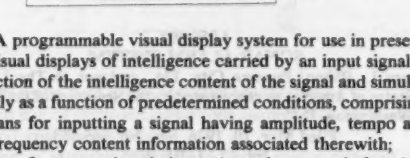
1. An optical character recognition system comprising a reader head which includes a single line array of photo sensitive elements, a clock pulse generator under control of which the elements of the array are sequentially sampled to produce video output pulses one from each element, the level of each pulse being dependent upon the light incident upon the element from which it originated, all elements being sampled in one scan and the elements being scanned repeatedly, data storage means into which the output pulses derived from the array are clocked under control of the clock pulse generator, a feature detector comprising gating circuits responsive to predetermined signals obtaining contemporaneously in two or more predetermined locations within the store for providing a signal indicating that a feature has been detected, a plurality of different features being detectable, each being regarded as having a certain priority relative to the others, priority selection gating means operative for selecting the feature having the highest priority detected in each scan, minimisation logic circuitry responsive to signals fed from the priority selection gating means and having a plurality of output lines one for each feature on an appropriate one of which a signal is produced each time the highest priority feature selected in the given scan differs from the feature having the highest priority selected in the previous scan, a plurality of feature storage locations one for each detected feature which are individually fed on an appropriate line from the minimisation logic circuitry and clocked synchronously by incoming signals fed on the said appropriate line so as to advance in synchronism data clocked into the feature stores, and a character recognition logic circuit responsive to the signals in the feature stores for providing an output signal indicating that a character has been recognised when predetermined features occur in a predetermined sequence within the feature stores.

4,056,805

PROGRAMMABLE ELECTRONIC VISUAL DISPLAY SYSTEMS

William M. Brady, P.O. Box 24C14, Los Angeles, Calif. 90024

Filed Dec. 17, 1976, Ser. No. 751,275
Int. Cl.[2] G08B *5/36*
U.S. Cl. 340—148 20 Claims



1. A programmable visual display system for use in presenting visual displays of intelligence carried by an input signal as a function of the intelligence content of the signal and simultaneously as a function of predetermined conditions, comprising:

means for inputting a signal having amplitude, tempo and frequency content information associated therewith;

means for generating timing pulses whose rate is functionally related to and synchronized to an amplitude component of the intelligence carried by said input signal;

means for counting said timing pulses and for generating a count signal representative of the total number of such pulses as a function of time;

memory means, responsive to said count signal, for providing a predetermined first memory output signal comprising a bit pattern which is representative of a predetermined light display pattern; and

display means, responsive to said first memory output signal,

for visually displaying a light pattern in response to said bit pattern as a function of time.

4,056,806

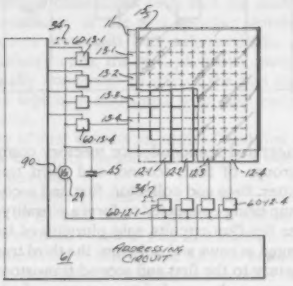
INTERFACING CIRCUITRY AND METHOD FOR MULTIPLE DISCHARGE GASEOUS DISPLAY AND/OR MEMORY PANELS

Larry J. Schmersal, Toledo, Ohio, and William E. Johnson, Temperance, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 161,853, July 12, 1971, which is a continuation-in-part of Ser. No. 699,170, Jan. 19, 1968, Pat. No. 3,618,071. This application Mar. 13, 1973, Ser. No. 340,783

Int. Cl.[2] G08B *5/36*; H01J *17/48*

U.S. Cl. 340—166 EL **2 Claims**



1. A display device arrangement comprising first and second pluralities of conductors arranged so as to define a matrix of crosspoint display cells, and first and second layers of dielectric material disposed between said first and second pluralities of conductors, characterized by a substantially uniform continuous layer of gaseous display material disposed between said first and second layers of dielectric material,

means for selectively addressing individual ones of said display cells to initiate a discharge breakdown threat, and sustaining means connected to each of said display cells and operative upon the initial discharge breakdown of individual ones of said cells for thereafter periodically breaking down said individual ones of said cells; and

said addressing means comprising respective pulse transformers having secondary windings connected to individual ones of said first and second pluralities of conductors, each said transformer having a primary winding connected to a respective address signal input lead, and wherein said sustaining means comprises an alternating signal source connected to the secondary windings of each of said pulse transformers.

4,056,807

ELECTRONICALLY ALTERABLE DIODE LOGIC CIRCUIT

Karvel Kuhn Thornber, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 16, 1976, Ser. No. 714,650

Int. Cl.[2] G11C *11/40*

U.S. Cl. 340—166 R **27 Claims**

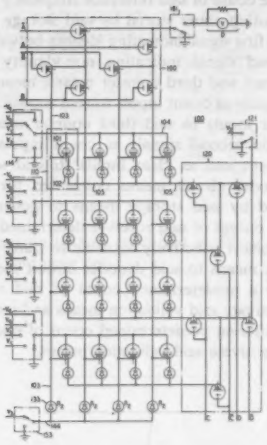
1. A logic circuit which comprises

a. a row column array, MxN in number, of three-terminal electrically unidirectional and reprogrammable logic cells, each cell having a first and a second high current carrying terminal and a third low current carrying gate terminal,

b. a plurality of M first electrically conductive row line means for connecting together the third terminals of all cells in each row to a different gate write-in row terminal,

c. a plurality of M second electrically conductive row line means for connecting together the first terminals of all cells in each row to a different row line signal terminal,

d. a plurality of N third electrically conductive column line means for connecting together the second terminals of all cells in each column to a different one of said column



lines, each column line connected at one terminal thereof to a different two-terminal column electrical load element for inhibiting current in the opposite sense of direction from said unidirectional cell and each column line having a column signal terminal.

4,056,808

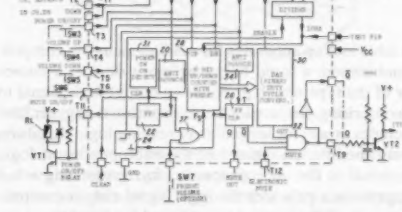
ULTRASONIC REMOTE CONTROL RECEIVER SUITABLE FOR TV RECEIVER

Jean Pierre Benhamou, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 30, 1976, Ser. No. 681,928

Int. Cl.[2] H04B *1/06*

U.S. Cl. 340—171 PF **16 Claims**



1. Remote control receiver for receiving continuous wave command signal pulses of different operating frequencies in individual signal channels within a selected frequency range; said receiver having an individual output for each signal channel; means for dividing the frequency of received command signal pulses by a predetermined factor to produce sequence control pulses; sequence generator means responsive to each sequence control pulse resulting from reception of a command signal within the selected frequency range to initiate a new counting cycle; reference frequency counter means for counting in each of said counting cycles reference frequency pulses having a frequency significantly higher than command signals in said selected frequency range; said command signal pulses in

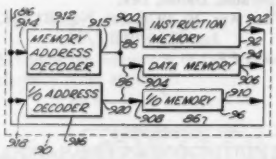
each channel giving rise to a different predetermined count of said reference frequency counter means during a counting cycle; storage means for storing the count of the reference frequency counter reached during a counting cycle; comparator circuit means for comparing at the end of each said counting cycle the count of said reference frequency counter means with the existing count stored by said storage means and for producing a first signal indicating identity between such counts and a second signal indicating non-identity between said counts; second and third counter means; means for applying said first signals as count inputs to said second counter means and as clear inputs to said third counter means; means for applying said second signals as count inputs to said third counter means and as clear inputs to said second counter means; decoder circuit means connected for receiving the count stored by said storage means to generage an output signal at an output of said receiver determined by said count; validation means selectively actuable to transfer the count of said storage means to said decoder circuit means; means responsive to a predetermined count of said second counter means to activate said validation means and means responsive only to a different predetermined count of said third counter means to inactivate said validation means.

4,056,809

FAST TABLE LOOKUP APPARATUS FOR READING MEMORY

John S. Hoerning; Richard P. Halverson, both of Minneapolis, and Darrell E. Nelson, Bloomington, all of Minn., assignors to Data Flo Corporation, Minneapolis, Minn.

Filed Apr. 30, 1975, Ser. No. 573,303
Int. Cl.[2] G06F *5/02, 9/06*
U.S. Cl. 364—200 **1 Claim**



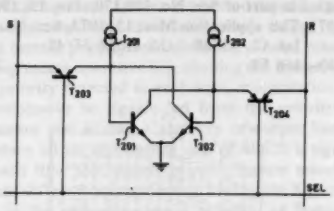
1. Fast table lookup apparatus for reading memory, comprising in combination: a logic bus; a memory device; a microprocessor of the type which provides an output logic signal to the bus comprising the contents of an internal register and which includes means for immediately reading logic signals on the bus into the internal register of the microprocessor; logic means, external to the microprocessor, for recognizing when the microprocessor provides the logic signal output comprising the contents of the internal register and for using the register contents available to address a location within the memory device and for substituting the contents of the memory location within the memory device, conforming to the microprocessor internal register contents, for the microprocessor internal register contents on the bus in time for the memory location contents to be read into the microprocessor as a part of the next input to the microprocessor; means for providing an electrical connection between the logic bus and the memory device; means for providing an electrical connection between the logic bus and the external logic; means for providing an electrical connection between the external logic and the memory device; means for providing an electrical connection between the logic bus and the microprocessor.

4,056,810

INTEGRATED INJECTION LOGIC MEMORY CIRCUIT

Cornelis Maria Hart, and Arie Slob, both of Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

Division of Ser. No. 505,663, Sept. 13, 1974, which is a continuation of Ser. No. 253,348, May 15, 1972, abandoned. This application Jan. 28, 1976, Ser. No. 653,131
Claims priority, application Netherlands, May 22, 1971, 7107040
Int. Cl.[2] G11C *11/40, 13/00*
U.S. Cl. 365—205 **8 Claims**



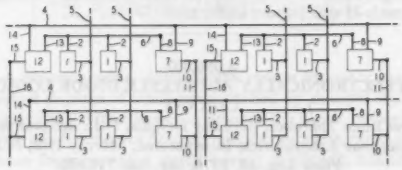
1. An integrated semiconductor memory comprising a plurality of groups of first, second, and third transistors each having emitter, base and collector, first and second transistors in each group being connected to form a plurality of cross-coupled trigger flip-flop circuits, said plurality of trigger circuits being arranged in rows and columns, the third transistors being complementary to the first and second transistors, a first read-write line commonly coupled to a column of trigger circuits, means connecting the first read-write line through the emitter-collector path of the third transistor to the base of the first transistor in that group, means for providing a circuit path from the emitters of the first and second transistors to a point of reference potential, a current injector coupled to the base zones of the first and second transistors and capable when forward biased of injecting carriers from a region outside of the first and second transistors and causing collection of the same or corresponding carriers by said base zones biasing the first and second transistors into operative condition, and a voltage supply line connected to the current injector.

4,056,811

CIRCUIT FOR THE IMPROVEMENT OF SEMICONDUCTOR MEMORIES

Roger T. Baker, P.O. Box 240, Mount Tabor, N.J. 07878

Filed Feb. 13, 1976, Ser. No. 657,769
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—189 **6 Claims**



1. In a random access memory of the class wherein
a plurality of memory cells,
a plurality of row conductors, and
a plurality of column conductors are disposed such that each of the said memory cells and a specific plurality of said row conductors are mutually associated with each other, and such that each of said memory cells and a specific plurality of said column conductors are mutually associated with each other,
such that, any particular one of said memory cells may be uniquely selected by selecting both the said specific plural-

ity of column conductors associated with that particular one of the said memory cells, and the said specific plurality of row conductors associated with that particular one of said memory cells, and furthermore,

such that the datum stored in any particular one of said memory cells may be determined by monitoring the electrical characteristics of the said specific plurality of row conductors associated with that particular one of the said memory cells, and appropriately activating the said specific plurality of column conductors associated with that particular one of the said memory cells.

a circuit to improve the output signal from the said memory cell comprised of,

a plurality of subrow conductors, each of said subrow conductors being associated with one of the said row conductors.

means for electrically connecting said memory cells to said subrow conductors such that for each particular row conductor of the said specific plurality of row conductors associated with any particular one of the said memory cells, the said particular memory cell is electrically connected to one of the said subrow conductors which is associated with said particular row conductor,

a plurality of first transistors, each of said first transistors having a control terminal, an input terminal, and an output terminal,

means for electrically connecting the said control terminal of each of the said first transistors to said subrow conductors such that each of said first transistors is electrically connected to one of said subrow conductors, and each of said subrow conductors is electrically connected to one of the said plurality of first transistors,

means for electrically connecting the said input terminal of each of the said first transistors to the said row conductors such that each particular one of the said first transistors is electrically connected to that particular one of the said row conductors with which the particular said subrow conductor which is connected to the said particular first transistor, is associated,

a plurality of second transistors, each of said second transistors having a control terminal, an input terminal, and an output terminal,

means for electrically connecting the said output terminal of each of said second transistors to the said subrow conductors such that each one of the said subrow conductors is electrically connected to one of the said second transistors,

means for electrically connecting the said input terminal of each of said second transistors to the said row conductors such that each particular one of the said second transistors is electrically connected to that particular one of the said row conductors with which the particular said subrow conductor which is connected to the said particular second transistor, is associated.

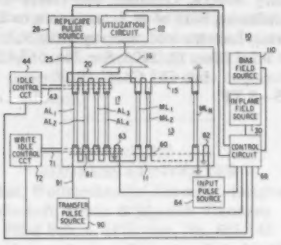
4,056,812

FAULT TOLERANT MAGNETIC BUBBLE MEMORY

Andrew Henry Bobeck, Chatham, and Robert Frederick Fischer, Livingston, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 6, 1976, Ser. No. 683,736
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—17 **16 Claims**

1. A magnetic memory comprising a layer of material in which single wall domains can be moved, a plurality of elements coupled to said layer for defining therein a plurality of closed-loop paths in which domain patterns are recirculated synchronously through first positions responsive to a cyclically varying magnetic field, said elements also defining a sequential accessing means and means for selectively moving domain patterns from said first positions to said sequential accessing means, said accessing means including a domain detector, said plurality of paths being organized into a main set and an auxiliary set, said memory also including means for controllably changing the positions in said sequential accessing



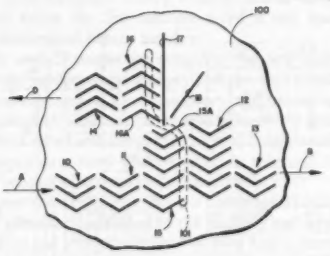
means of the domain pattern from said auxiliary set with respect to that of said main set.

4,056,813

PASSIVE CHEVRON REPLICATOR

Thomas R. Oeffinger, Placentia, and Leonard R. Tocci, Laguna Niguel, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 20, 1975, Ser. No. 623,681
Int. Cl.[2] G11C *11/02*
U.S. Cl. 365—12 **12 Claims**



10. A passive replicator for magnetic bubble domains comprising,

a first column of magnetizable chevron elements associated with a first propagation path,

a second column of magnetizable chevron elements associated with a second propagation path,

said first and second columns of magnetizable chevron elements arranged in an overlapping array such that the ends of the chevrons in said first column are aligned approximately with the apices of the chevrons in said second columns, and

an elongated magnetizable bar element arranged to be substantially parallel to said first column of magnetizable chevron elements and aligned with the apices of the chevrons in said second column so as to selectively provide an attracting pole and repelling pole at the end thereof to split a magnetic bubble domain stretched between said first and second columns of magnetizable chevron elements.

4,056,814

MAGNETORESISTIVE ELEMENT FOR DETECTING MAGNETIC BUBBLES

Andrew Henry Bobeck, Chatham, and Henry Evelyn Derrick Scovil, Gladstone, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 10, 1976, Ser. No. 665,421
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—8 TF **2 Claims**

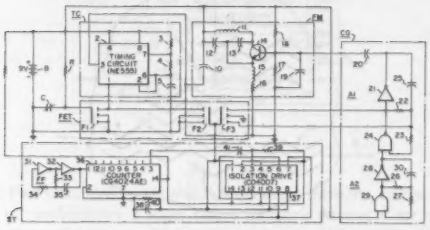
1. A magnetic bubble memory comprising a layer of material in which magnetic bubbles can be moved, a magnetoresistive detector and means for moving said bubbles to said detector, said detector comprising a plurality of chevron elements, said elements being aligned along an axis transverse to the path of bubble movement, said chevron elements being interconnected by interlinking elements into a single magnetoresistive element, said interlinking elements being arranged in at least first, second, and third groups to link together pairs of adjacent elements in at least three different sets of corresponding positions.

4,056,815

BATTERY OPERATED TRANSMITTER CIRCUIT

Arthur Ernest Anderson, Franklin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 3, 1976, Ser. No. 655,036
Int. Cl.[2] G08B *21/00, 29/00, 1/00*
U.S. Cl. 340—224 **4 Claims**



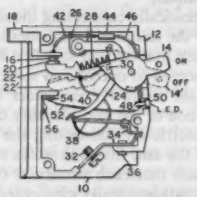
1. A battery operated RF transmitter circuit, comprising:
a battery,
an ON-OFF condition responsive device for connecting said battery through a high impedance means when said ON-OFF condition responsive device is in an OFF state to provide minimum current drain from said battery,
transmitter circuit means including:
a cycle timer means,
first switch means responsive to the ON state of said ON-OFF condition responsive device for activating said cycle timer means to connect said battery to said transmitter circuit means,
RF oscillator means connected to said cycle timer means, said cycle timer means periodically activating said RF oscillator means to produce an RF output waveform,
tone code generator means connected to said RF oscillator means and responsive to the ON state of said ON-OFF condition responses means to frequency modulate said RF output to transmit a first predetermined tone indicative of the ON state of said ON-OFF condition responsive device,
self-test circuit means,
second switch means connected between said self-test circuit means and said cycle timer means to periodically activate said cycle timer means in response to said self-test circuit means to connect said battery to said transmitter circuit means and activate said RF oscillator means to produce an RF output signal, the activation of said cycle timer means by said second switch means further activating said tone code generator means to frequency modulate said RF output at a frequency to transmit a second predetermined tone distinct from said first predetermined tone and indicative of a circuit test signal, said cycle timer means determining the duration and repetition rate of said first and second predetermined tones.

4,056,816

LIGHT EMITTING DIODE BLOWN CIRCUIT BREAKER INDICATOR

Raul Guim, 834 Venetia, Coral Gables, Fla. 33135

Filed Oct. 5, 1976, Ser. No. 729,664
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—253 A **6 Claims**



1. In a conventional circuit breaker (**10**) having a stationary contact (**16**) on a line terminal clip (**18**), a movable contact (**20**), a contact carrier (**22**) having the movable contact (**20**) mounted thereon, an operating mechanism including a handle (**14**) for manually moving the movable contact carrier (**22**) to selectively open and close the line circuit contact (**16** and **20**), a load terminal (**32**) from which the load circuit extends through the line contacts (**16** and **20**), a tripping mechanism including an overload circuit responsive member (**38**) in the load circuit between the movable contact (**20**) and the load terminal contact (**32**) for moving the contact carrier (**22**) to open the contacts and interrupt the load circuit in response to an overload condition through the overload responsive member (**38**); the improvement comprising a blown circuit indicator circuit (**42–56** and **24'**, **22**, **40**) in parallel with the load circuit, said blown load circuit indicator parallel circuit being connected to the line circuit and load circuit terminals (**18** and **32**) and through and including a resistor (**44**) in series with a light emitting diode (**50**), a fixed contact (**56**), and a movable parallel circuit contact (**24'**) held in parallel circuit interrupting position by said overload responsive member (**38**) until said overload responsive member is actuated to load circuit interrupting position to thus actuate said parallel circuit contact (**24'**) to parallel circuit completing position (**24'**) to light up said light emitting diode (**50**) to remain lit up to indicate that the load circuit breaker has blown.

4,056,817

SYSTEM FOR MONITORING A PERIODIC FUNCTION

Wesley J. Bachman, Auburn, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

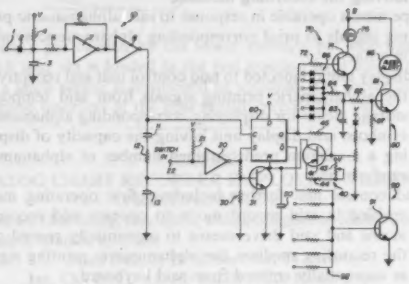
Filed Nov. 22, 1976, Ser. No. 744,174
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—253 Y **13 Claims**

1. A system for monitoring the frequency of a periodic function and indicating whether or not said function frequency

differs from a predetermined frequency, said function frequency being represented by an electrical signal having a parameter which varies systematically in accordance with the period of said function, said system comprising:

means for generating a control signal having a characteristic which starts at a reference level and attains a predetermined level after the passage of a preselected period of time;

first switching means coupled to said control signal generating means and having two switching states, said first switching means being normally biased to one of said switching states but responsive to said control signal characteristic attaining said predetermined level for switching to the other of said switching states;



indicating means coupled to said first switching means for indicating which state said switching means is in; and

second switching means coupled to said control signal generating means and responsive to said systematic variation of said parameter for periodically resetting said characteristic of said control signal to said reference level, whereby the first switching means is in one of its two switching states when the function period is less than the preselected period of time and is in the other switching state when the function period is greater than the preselected period of time, and the system thus indicates whether or not the function is occurring at the predetermined frequency.

4,056,818

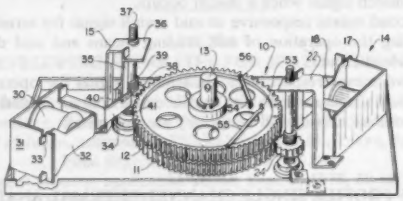
AUTOMATIC SURVEILLANCE SYSTEM FOR TIME SEQUENCE OPERATIONS

Robert Oddsen, 136 W. Waterview, Northport, N.Y. 11768

Filed Dec. 29, 1975, Ser. No. 644,697

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—309.4 **33 Claims**



1. Automatic surveillance system for time sequence operations which comprises:

first and second rotary members mounted in operative facing relation for rotation about a common axis,

first and second pulse energized rotation imparting means operatively arranged to move independently said first and second rotary members respectively in selective amplitude rotational increments in accordance with the timing of the corresponding pulses of said first and second rotation imparting means,

sensing means moving with said first member and selectively rotationally spaced contact means for said second member in operative relation to said sensing means for ascertaining a difference in relative rotational movement between said first and second members, and

means for energizing one of said rotation imparting means at a predetermined time pulse and means for energizing the other of said rotation imparting means at a random time pulse in dependence upon the time sequence operation under surveillance.

4,056,819

ADDRESS CONVERTER

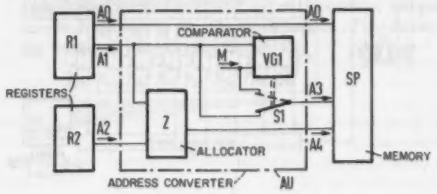
Eberhard Lukas, Wolfratshausen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 4, 1976, Ser. No. 655,145

Claims priority, application Germany, Feb. 26, 1975, 2508373

Int. Cl.[2] G11C *8/02*; G06F *5/00*

U.S. Cl. 340—347 DD **7 Claims**



1. An address converter for converting first addresses into second addresses which are fed to a memory of a data processing device, wherein the first addresses contain first and second address words and the second addresses contain third and fourth address words, said address converter comprising:

a comparator for receiving a first address word and a predetermined binary number and responsive thereto to provide a first binary value when the first address word is less than the predetermined binary number and a second binary value when the first address word is not less than the predetermined binary number;

transfer switch means for receiving the first address word and the predetermined binary number, said transfer switch means connected to the memory and connected to and operated by said comparator to selectively feed the first address word and the predetermined binary number to the memory as a third address word in response to the first and second binary values, respectively; and

an allocator for receiving the first and second address words, said allocator connected to the memory and responsive to the first and second address words to feed a fourth address word to the memory.

4,056,820

REVERSIBLE ANALOG TO DIGITAL CONVERTER

Ernst Hofer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 27, 1976, Ser. No. 709,125

Claims priority, application Germany, July 30, 1975, 2534109

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 C **5 Claims**

1. Apparatus for converting analog signals from a source thereof into digital signals for transmission and transmitted digital signals into analog signals for an analog receiver, comprising:

digital to analog converter means,

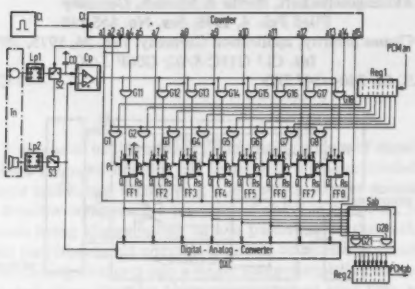
comparator means having a first input connected to an output of said digital to analog converter means and a second input connected to receive said analog signals from said source,

a multistage binary counter,

intermediate register means having a plurality of bistable stages,

first logic means coupled to receive an output from said comparator means and to enable communication of outputs from predetermined ones of said stages of said counter to respective ones of said stages of said intermediate register,

means coupled to a first predetermined stage of said binary counter and responsive to an output signal therefrom for enabling the communication of a digital signal to be converted to said digital to analog converter during a first interval when a digital to analog conversion is to take place



gate means coupled to a second predetermined stage of said binary counter and responsive to an output signal therefrom for rendering said digital to analog converter operative during an interval when an analog to digital conversion is to take place,

output register means having inputs connected, respectively, to outputs of said intermediate register for producing output digital signals, and

input register means having an input for receiving digital signals to be converted and outputs connected, respectively, to set inputs of said bistable stages of said intermediate register means.

4,056,821

TEXTUAL PROCESSING SYSTEM UTILIZING DISPLAY AIDED ASSOCIATIVE SEARCHING FEATURE

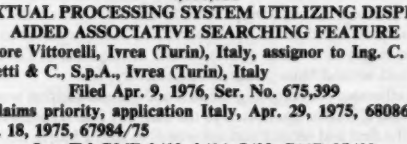
Vittore Vittorelli, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Apr. 9, 1976, Ser. No. 675,399

Claims priority, application Italy, Apr. 29, 1975, 68086/75; Apr. 18, 1975, 67984/75

Int. Cl.[2] G06F *3/12, 3/14, 7/28;* **G11B** *27/02*

U.S. Cl. 364—900 **7 Claims**



1. A textual processing system comprising:

a keyboard having a plurality of symbol printing keys providing alphanumeric printing signals;

a record mode signal means for conditioning the system into a record mode of operation;

a search mode signal means for conditioning the system into a search mode of operation;

a start search signal means for providing a start search signal which commences the search mode of operation;

a control unit connected to said keyboard and including; temporary storage means having a plurality of storage locations, each location having a capacity of storing the alphanumeric printing signals corresponding to alphanumeric print symbols;

a record unit connected to said control unit including: means for recording the alphanumeric printing signals on a recording medium from said temporary storage means, means for reading said signals from the recording medium into said temporary storage means, and drive means for moving the recording medium;

type means operable in response to said alphanumeric printing signals to print corresponding alphanumeric symbols in a line;

a display unit connected to said control unit and receptive of the alphanumeric printing signals from said temporary storage means for displaying corresponding alphanumeric symbols, said display unit having the capacity of displaying a maximum predetermined number of alphanumeric symbols; and

said control unit further including: first operating means enabled in said record mode to operate said recording means and said drive means to sequentially record onto the recording medium the alphanumeric printing signals as sequentially entered from said keyboard,

storing means enabled in said search mode for storing a group of alphanumeric printing signals entered from said keyboard and not exceeding in number said maximum predetermined number, into a first section of said temporary storage means,

second operating means enabled in said search mode for operating said display unit to display the symbols corresponding to the signals stored in said first section of said temporary storage means,

first means responsive to said start search signal for operating said reading means and said drive means for sequentially shifting the signals read from the recording medium into a second section of said temporary storage means, each location of said first section being in correspondence with a location of said second section,

comparing means enable in said search mode upon reception of said start search signal for continuously comparing, during the operation of said reading means, the alphanumeric printing signals stored in the location of said first section of the temporary storage means with the signals stored in the corresponding locations of said second section of the temporary storage means, and for generating a match signal when a match occurs,

second means responsive to said match signal for terminating the operation of said reading means and said drive means, and

third means responsive to said match signal for operating said display unit to display the entire content of said second section of said temporary storage means.

4,056,822

LOW PROFILE SINGLE CHANNEL THERMAL ANALOG RECORDER

David D. Thornburg, Los Altos, and Geoffrey O. Thompson, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

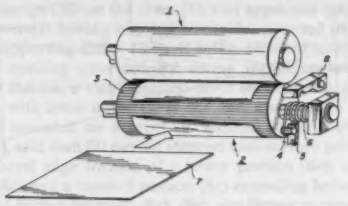
Filed Dec. 3, 1976, Ser. No. 747,164

Int. Cl.[2] G01D *15/10, 15/24;* **H05B** *3/20*

U.S. Cl. 346—76 R **10 Claims**

1. A thermal analog recorder comprising an upper thermally conductive roller and an electrically insulating lower roller which is engageably positioned with respect to said upper roller to provide a nip therebetween through which recording paper may pass, said lower roller having disposed on at least

part of the surface thereof a tapered resistor heating element said tapered resistor element comprising a tapered electrically resistive element which develops a non-uniform temperature profile upon electrical energization from the output of a test



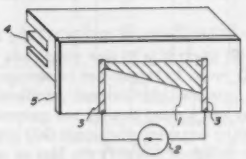
source, a pin carried by the lower roller, a pin stop against which said pin is loaded in the rest position by a coil spring, and a latch which is positioned to terminate the travel of the pin upon insertion of the heat sensitive recording paper.

4,056,823

ANALOG CHART RECORDER EMPLOYING THERMAL PRINTING MEANS

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,165
Int. Cl.[2] G01D *15/10*; H05B *3/20*; H01C *3/08*
U.S. Cl. 346—76 R **6 Claims**



1. An analog chart recorder comprising a heater assembly said assembly comprising a tapered electrically resistive element which develops a non-uniform temperature profile on electrical energization along its length, a substrate which underlies said resistive film which is in thermal contact with said resistive film, a heat sink in thermal contact with said substrate which provides that the temperature distribution will achieve steady state, and means for advancing a heat sensitive media past and in contact with the heater assembly.

4,056,824

DEVELOPING APPARATUS FOR DIAZO COPYING MACHINE

Kiyotaka Iiyama; Takeshi Matsui, both of Yokohama; Shigeru Kusakata, Kawasaki, and Michihisa Takahashi, Tachikawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sept. 1, 1976, Ser. No. 719,864
Claims priority, application Japan, Sept. 3, 1975, 50-106799; Sept. 4, 1975, 50-107402
Int. Cl.[2] G03D *7/00*
U.S. Cl. 354—300 **15 Claims**

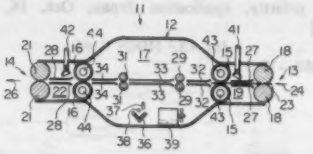
1. In a diazo copying machine, a developing apparatus comprising:

a housing formed with an inlet opening and an outlet opening;

a pair of inner inlet feed rollers and a pair of inner outlet feed rollers operatively disposed in the housing in substantially sealing cooperation to define therebetween a developing chamber within the housing;

a pair of outer inlet feed rollers provided within the housing adjacent to the inlet opening in substantially sealing cooperation to define with the inner inlet feed rollers an inlet chamber therebetween;

a pair of outer outlet feed rollers provided within the housing adjacent to the outlet opening in substantially sealing cooperation to define with the inner outlet feed rollers an outlet chamber therebetween;



means for introducing a vaporized developing fluid into the developing chamber; and

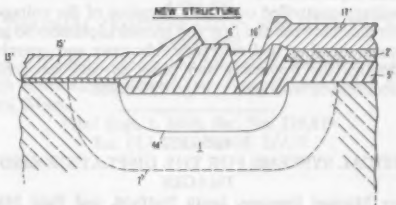
heating means provided in the housing to maintain the developing chamber and inlet and outlet chamber at temperature high enough to prevent condensation of the developing fluid and water vapor therein.

4,056,825

FET DEVICE WITH REDUCED GATE OVERLAP CAPACITANCE OF SOURCE/DRAIN AND METHOD OF MANUFACTURE

Ronald Philip Esch, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 591,995, June 30, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,801
Int. Cl.[2] H01L *29/78, 29/34, 29/04*
U.S. Cl. 357—23 **11 Claims**



1. A semiconductor device having reduced parasitic capacitance comprising

a. a semiconductor substrate of a first conductivity type,

b. a first insulating layer including an opening disposed on the substrate,

c. at least one diffused region of a second conductivity type disposed in the substrate and beneath the opening in the layer,

d. a second insulating layer disposed on the first insulating layer and in the opening, the second layer in the opening having a thicker dimension than the first insulating layer,

e. a third insulating layer disposed on the substrate adjacent to but not extending over the diffused region, and

f. a conductor overlying the third insulating layer and at least a portion of the second layer, the parasitic capacitance related to the conductor overlap of the second and third layers being less than 0.039 picofarads per mil along one side of the conductor dimension over the diffused region.

4,056,826

SUBCARRIER REGENERATION CIRCUIT FOR COLOR TELEVISION RECEIVERS

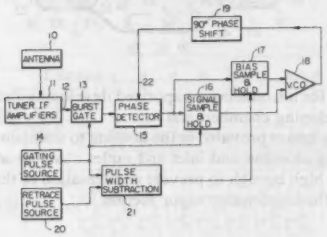
Yasuaki Watanabe; Yukio Okabe, and Mitsuru Hayakawa, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Oct. 15, 1976, Ser. No. 732,598

Claims priority, application Japan, Oct. 16, 1975, 50-140053[U]

Int. Cl.² H04N *9/46*

U.S. Cl. 358—19 **6 Claims**



1. A subcarrier regeneration circuit for a color television receiver adapted to receive a composite color television signal including a color burst contained in a flyback interval and a chroma signal between successive ones of the flyback intervals, the subcarrier regeneration circuit comprises:

a phase detector for generating an output representative of the difference in phase between the color burst and a reference subcarrier;

a first sample-and-hold circuit operable to sample the output from the phase detector during the interval of the color burst and storing the sampled signal into a first capacitor;

means for generating a sampling pulse with a duration equal to the flyback interval minus the interval of the color burst;

a second sample-and-hold circuit operable to sample the output from the phase detector during the interval of said sampling pulse and storing the sampled signal into a second capacitor; and

a voltage controlled oscillator receptive of the voltage difference between the first and second capacitors to generate a signal at said reference subcarrier and operable to control the frequency and phase of said subcarrier in accordance with said voltage difference.

4,056,827

OPTICAL SYSTEMS FOR THE DISPLAY OF VISUAL IMAGES

Archer Michael Spooner, South Nutfield, and Paul Michael Murray, Tunbridge Wells, both of England, assignors to Redifon Limited, London, England

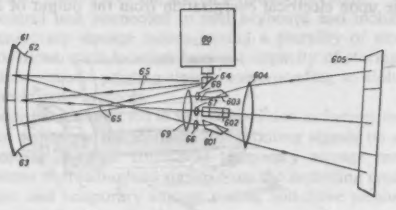
Filed Oct. 28, 1975, Ser. No. 626,546

Claims priority, application United Kingdom, Oct. 30, 1974, 46942/74

Int. Cl.² H04N *7/18*

U.S. Cl. 358—87 **8 Claims**

1. An optical display system, for the display of visual images, comprising a first optical system for viewing an object and providing a first image having a first format, a second optical system for dissecting said first image and providing a second image having a second format different from said first format, an electro optic system for viewing the said second image and providing a third image, substantially reproducing said second image parts and having substantially the same (second) format, and a third optical system for viewing the said third image and providing a fourth image substantially reproducing the said fourth image parts and having substantially the same (first) format in which the said first image format and said format (final) image format are both wide-angle image formats, having at least three times as great width as height, and said first image is dissected into and said fourth (final) image is reproduced from at least three image parts separated at boundaries all of



which are off-centre with respect to the said first and said fourth (final) images.

4,056,828

RUN LENGTH ENCODING AND DECODING METHODS AND MEANS

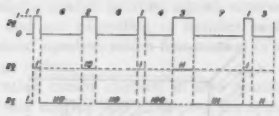
Eiichiro Furuta, Ebina, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 27, 1976, Ser. No. 726,865

Claims priority, application Japan, Sept. 29, 1975, 50-117394

Int. Cl.² H04N *7/12*

U.S. Cl. 358—133 **7 Claims**



1. A data compressor for compressing a binary video signal having a raster scan format, said video signal having one logic level for background representing picture elements and an opposite logic level for image representing picture elements; said compressor comprising the combination of

white run length encoding means for converting runs of said video signal at said one logic level into binary white run length message codes,

black run length encoding means for converting runs of said video signal at said opposite logic level into binary black run length message codes, and

ternary encoding means for alternatively responding to the binary white and black message codes from each scan line of said video signal and for selectively level shifting bits of said message codes to provide a series of ternary black and white run length message codes having intra-scan line code boundaries marked by distinctive amplitude transitions.

4,056,829

DEVICE FOR DETACHABLY MOUNTING A MANUSCRIPT ON A ROTARY CYLINDRICAL DRUM FOR CYLINDER SCANNING TYPE FACSIMILES

Masachika Ikeda, Tokyo, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed June 7, 1976, Ser. No. 693,927

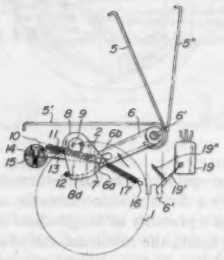
Claims priority, application Japan, June 11, 1975, 50-70301

Int. Cl.² H04N *1/03*

U.S. Cl. 358—256 **1 Claim**

1. An apparatus for detachably mounting a manuscript on a

cylindrical drum for cylinder scanning type facsimiles, employing a rotary cylindrical drum (1) around which is wound a manuscript (20), a clamping bar (2) arranged in parallel with an axis of the rotary cylindrical drum (1) being resiliently urged against the drum (1) so as to detachably move one end of the manuscript (20) on the drum (1), said apparatus including a drum cover (5) having one end rotatably mounted on a shaft (6') for supporting frame (1') and being disposed to open and close an opening provided for casing means enclosing the drum (1) therein, a cam operated lever (6) being integral and rotatable with drum cover (5) at one end, a segmental cam (8) rotatably mounted on a pivot (9) secured to the supporting frame (1'), said cam (8) having stepped cam surface portions at its peripheral edge formed of a lower portion (8*a*), a higher portion (8*b*) and a tapered portion (8*c*) extending between the lower and higher portions (8*a*), (8*b*), the higher portion being terminated at a projection (8*d*), said cam (8) being further



defined by a pin (7) which is connected through a spring 11 passing over the center axis of said pivot (9) of the segmental cam (8) in response to movement of cover (5) from closed to fully open positions, respectively, an arm (13) cooperating with said clamping bar (2) and having one end rotatably supported by a pin (14) threadedly engaged to shaft (15) disposed perpendicular to said pin (14) and rotatable about its axis, the free end of said arm (13) being resiliently urged against said stepped cam surface portion of said segmental cam (8); block piece (18) associated with arm (13) being adapted to selectively operate said clamping bar (2), and microswitch 19 having normally open contacts which close responsive to the operation of said cam operating lever (6) when said drum cover (5) arrives at its fully closed position (5') to thereby energize a driving motor of said drum (1), and the contacts of microswitch (19) being open responsive to opening of said drum cover (5) for deenergization of said driving motor of said drum (1).

4,056,830

UTILIZING DATA FOR TRANSDUCER POSITIONING

Douglas A. Smith, Blairadam by Kelty, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 527,896, Nov. 27, 1974. This application Feb. 17, 1977, Ser. No. 769,614

Claims priority, application United Kingdom, Mar. 15, 1974, 11610/74

Int. Cl.[2] G11B *5/09, 5/43*

U.S. Cl. 360—51 **9 Claims**

1. A method of recording data at different clock frequencies on a plural-track record disk comprising the steps of:

detecting addresses of a plurality of tracks;

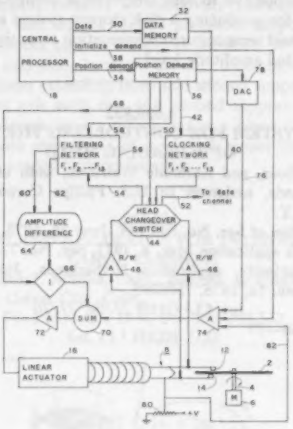
generating a nominal clock frequency;

varying said nominal clock frequency by a predetermined amount, said amount dependent on said detected addresses;

generating a plurality of differing clock frequencies from said varying nominal clock frequency, said plurality of clock frequencies corresponding to said plurality of detected track addresses;

sorting said differing clock frequencies into a plurality of frequency groups;

dividing each of said frequency groups into two subgroups wherein said differing clock frequencies increase with respect to said nominal clock frequency in one of said subgroups and decrease with respect to said nominal clock frequency in said other subgroup; and



recording said data at said plurality of clock frequencies on said plural-track record disk, each of said differing clock frequencies being interlaced between adjacent tracks such that each odd track has a relatively large clock frequency difference with respect to an adjacent even track but a relatively small clock frequency difference with respect to a next closest odd track, said clock frequency at which said data is recorded being the same at corresponding tracks among said plurality of groups.

4,056,831

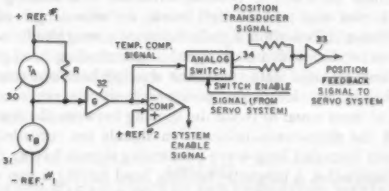
THERMAL COMPENSATION FOR DISK PACK SYSTEMS

Joseph C. Godbout, Acton, and Michael A. Feldstein, Sudbury, both of Mass., assignors to Data General Corporation, Southboro, Mass.

Filed Sept. 1, 1976, Ser. No. 719,819

Int. Cl.[2] G11B *21/08, 21/10*

U.S. Cl. 360—77 **5 Claims**



1. Temperature compensation means for disk storage systems which include a base member, means for mounting one or more disks having a plurality of data information tracks, one or more record/read heads capable of being movably positioned with respect to said tracks for recording data information on or reading data information from said tracks, and position servo loop means for controlling the movement of said one or more heads to a commanded position in response to a position command signal, said loop means including means for providing a position feedback signal representing the position of said one

or more heads with respect to said tracks, said temperature compensation means comprising

temperature error sensing means for providing a temperature compensation error signal;

means for combining said temperature compensation error signal with said position feedback signal to provide a combined feedback signal and for supplying said combined feedback signal to said position servo loop, and

means responsive to said temperature compensation error signal for producing a disk storage system enable signal when said temperature compensation error signal is below a selected amplitude level.

4,056,832

SERVO SYSTEM FOR CONTROLLING THE POSITION OF A READING HEAD

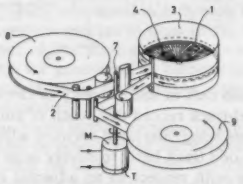
Jacob de Boer, and Anthonie Walraven, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 590,138, June 25, 1975, abandoned. This application Mar. 4, 1977, Ser. No. 774,523

Claims priority, application Netherlands, July 15, 1974, 7409513; Jan. 14, 1975, 7500395

Int. Cl.[2] G11B *21/04, 21/10*

U.S. Cl. 360—77 **12 Claims**



1. A servo system for controlling the position of a magnetic reading head relative to the center of a selected data track in a magnetizable layer of a recording medium that is relatively movable with respect to the reading head and is provided with a plurality of spaced tracks extending parallel to each other, said system comprising means for receiving short wave information signals and at least two ordered long-wave positioning signals, each of said long-wave positioning signals having a different frequency, means for recording said information signals in successive tracks and for successively superimposing each ordered position signal in separate ones of said data tracks in longitudinal alignment with said short-wave information signals in the magnetizable layer in which the data tracks are recorded, said positioning signals having a wavelength of a magnitude sufficient to produce crosstalk in a reading head placed over said selected data track, the wavelength of said short-wave information signals being of a magnitude insufficient to produce a crosstalk signal in said reading head placed over said selected data track, the spacing between tracks in which adjacent longwave positioning signals are recorded being at most equal to twice the spacing between the tracks in which the short-wave information signals are recorded, the adjacent recorded long-wave positioning signals having different frequencies, a magnetic reading head having a gap width substantially equal to the width of each track so as to scan the full width of a selected track and to simultaneously read all signals in said selected track and only the long-wave positioning signals in the tracks on either side thereof, said reading head producing during reading a composite signal, frequency sensitive electronic means for separating the two positioning signals read from the tracks on either side of the selected tracks from the composite signal, means for effecting a frequency comparison between the positioning signals and producing a servo signal which is a function of the deviation of the reading head from the center of the selected track and means responsive to the servo signal for adjusting the relative position between said reading head and said magnetic medium to align said reading head with said selected data track.

4,056,833

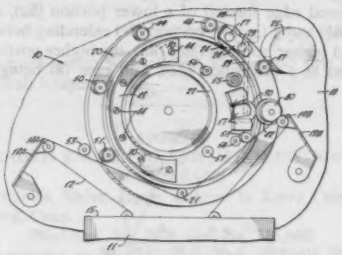
TURNTABLE ASSEMBLY FOR VIDEO CASSETTE RECORDER/REPRODUCER

Gordon Schulz, Villa Park, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Mar. 10, 1976, Ser. No. 665,689

Int. Cl.[2] G11B *15/66*

U.S. Cl. 360—85 **16 Claims**



1. A turntable assembly for helically threading tape which has been withdrawn from a video cassette around a video scanner and across a plurality of longitudinal magnetic recording/reproducing heads, the rotational axis of said video scanner being tilted relative to said cassette, comprising:

an annular turntable ring surrounding said video scanner and said heads and having a rotational axis which is tilted relative to said rotational axis of said scanner and said video cassette, said magnetic heads being positioned in parallel, spaced relationship, coplanar to said turntable ring;

means for rotating said turntable ring between first and second positions; and

a lead guide post fixedly mounted on said turntable ring and extending perpendicular thereto, said lead guide post being positioned, in said first position of said turntable ring, out of the plane of said cassette, said lead guide post, upon rotation of said turntable ring from said first to said second position, intersecting the plane of said video cassette so as to engage said tape withdrawn therefrom and wrap said tape around said scanner, said lead guide post threading said tape across all of said longitudinal magnetic heads as said turntable ring rotates from said first to said second position, said turntable ring rotating through an angle greater than 360° in threading said tape around said scanner and across said magnetic heads.

4,056,834

MAGNETIC VIDEO RECORDER AND CASSETTE PROVIDING TAPE LOADING

Mamoru Hiroyasu, Saijo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 20, 1976, Ser. No. 688,288

Claims priority, application Japan, May 26, 1975, 50-63186

Int. Cl.[2] G11B *15/66, 23/04*

U.S. Cl. 360—85 **7 Claims**

1. In combination, a magnetic tape cassette and a magnetic video recording and reproducing apparatus for use with a magnetic tape,

said magnetic tape cassette comprising,

a cassette casing,

supply and take-up reels mounted rotatably within said cassette casing, said magnetic tape being supplied by said supply reel and taken up by said take-up reel,

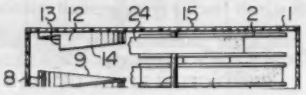
a hollow cylindrical member having a longitudinal axis

defining an axial direction, said magnetic tape being wound spirally around said hollow cylindrical member,

supporting means for supporting said hollow cylindrical member within said cassette casing so that said hollow cylindrical member is translated in the axial direction when said hollow cylindrical member is rotated about said longitudinal axis, and

said magnetic video recording and reproducing apparatus comprising,

a magnetic head drum having a rotatable magnetic head, said magnetic head drum being received in the hollow interior of said hollow cylindrical member when said magnetic tape cassette is mounted on said magnetic video recording and reproducing apparatus, and



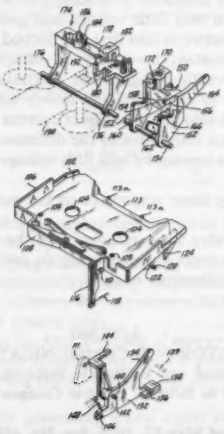
driving means mounted within said magnetic video recording and reproducing apparatus for engaging said hollow cylindrical member and rotating it selectively in either direction, said magnetic tape wound around said hollow cylindrical member being thereby transferred onto said magnetic head drum when said hollow cylindrical member is withdrawn from said cassette case by rotating it in one direction by said driving means, said magnetic tape wound around said magnetic head drum being transferred onto said hollow cylindrical member when said hollow cylindrical member is moved into said cassette casing by rotation thereof in the opposite direction by said driving means.

4,056,835

HEAD SUPPORT AND EJECT MECHANISM FOR RECORDING AND/OR PLAYBACK APPARATUS

James C. Whitney, Fairfield, and Anthony Ciaraldi, Stamford, both of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Apr. 20, 1976, Ser. No. 678,596
Int. Cl.[2] G11B *21/22, 15/04, 5/12*
U.S. Cl. 360—105 **18 Claims**



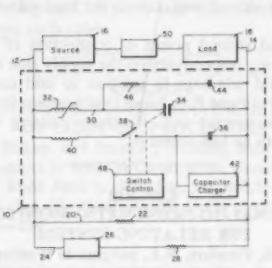
1. In a recording and/or playback apparatus of the type wherein information is recorded on and/or played back from magnetic tape driven past a record and/or playback head, support apparatus for said head, comprising a first pivotable support member upon which said head is mounted; means extending from said first support member for pivotally coupling said first support member to a pivot axis such that said first support member and said head are pivotable through an arc which lies in a plane substantially normal to the movement of said tape; means for controlling the pivotal movement of said first support member to selectively place said head in contact with said tape; a second pivotable support member disposed adjacent said first support member; an erase head mounted on said second support member to selectively contact said tape; means extending from said second support member to said pivot axis such that said second support member is pivotable through an arc which lies in a plane substantially normal to said movement of tape; and means for pivotally moving said second support member.

4,056,836

METHOD AND APPARATUS FOR INTERRUPTING LARGE CURRENT

Wolfgang Knauer, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 23, 1976, Ser. No. 669,553
Int. Cl.[2] H02H *7/22*
U.S. Cl. 361—4 **12 Claims**



1. Switching apparatus for interrupting large current comprising:

a main branch comprising a saturable reactor, main switch contacts serially connected therewith, said main switch contacts having means connected thereto for rapidly opening said main switch contacts;

a commutation branch connected in parallel to said main branch, said commutation branch comprising the serial connection of a commutation capacitor, an inductor and a commutation switch; and

means connected to control both said main switch contacts and said commutation switch for discharging commutation current through said main switch contacts to reduce current therethrough to zero and for opening said main switch contacts when the current therethrough is substantially zero.

4,056,837

GROUND FAULT CIRCUIT INTERRUPTER WITH TRIP LEVEL ADJUSTMENT

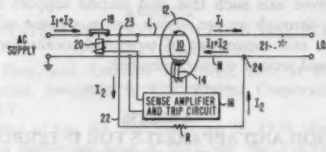
John J. Misencik, Shelton, and Gary S. Zakrzewski, Bridgeport, both of Conn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 24, 1975, Ser. No. 625,615
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—45 **4 Claims**

1. A ground fault circuit interrupter comprising:

a differential current transformer including a core, primary windings on said core that comprise a hot line conductor and a neutral conductor, a secondary winding on said core

for sensing a differential current between said primary winding; a sensing amplifier responsive to said differential current to produce a signal for operating circuit interruption means upon a differential current being of predetermined magnitude, said sensing amplifier being characterized by responding only to a given polarity of current differential between said primary windings, sensitivity adjustment means for causing an effective change in the sensitivity of said sensing amplifier comprising a continually closed circuit branch connected between a first point on said hot line conductor on a first side of said core and a second point on said neutral conductor on a second side of said core, said circuit branch containing a resistance for



causing additional current flow vectorially added to differential current otherwise occurring between said primary windings;

said sensing amplifier being responsive only to positive differential currents through said hot line conductor from the supply side of said core to the load side of said core; and

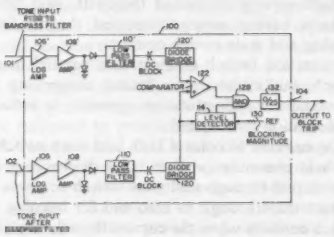
said first and second points of connection of said circuit branch being respectively on the supply side and the load side of said windings in relation to said core and said additional current flow being in opposition to said normal differential current and effectively causing said sensing amplifier to be less sensitive.

4,056,838

IN-BAND SIGNAL-TO-NOISE RATIO MONITOR FOR AN FSK RELAYING SYSTEM

Michael J. Leib, Flanders, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 20, 1976, Ser. No. 725,067
Int. Cl.[2] H02H *3/26*
U.S. Cl. 361—68 **8 Claims**



1. In a relaying network having guard and trip signal input means, a trip relay and control circuit means cooperatively coupling said guard and trip signal input means and said trip relay, monitoring apparatus for blocking actuation of said trip relay whenever the signal-to-noise ratio of a transmitted signal exceeds a predetermined value, said apparatus comprising:

a. a bandpass filter having an input terminal adapted to receive a transmitted signal and an output terminal adapted to forward a filtered signal therefrom to said guard and trip signal input means;

b. first signal-to-noise detecting circuit means connected to said bandpass filter input for generating a first output signal which is a function of the signal-to-noise ratio of the transmitted signal;

c. second signal-to-noise detecting circuit means connected to said bandpass filter output for generating a second output signal which is a function of the signal-to-noise ratio of the filtered transmitted signal;

d. means for generating a reference voltage signal proportional to a predetermined acceptable value of a signal-to-noise ratio in the transmitted signal;

e. level detection means adapted to receive said second output signal and said reference voltage signal for comparing said signals and for generating a third output signal whenever said second output quantity exceeds said reference signal; and

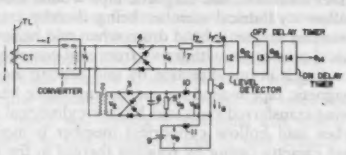
f. comparator means, adapted to receive said first, second and third output signals and having an output connected to said control circuit means, for generating a blocking signal usable to block coupling of said trip input means and said trip relay whenever said first, second and third output signals reach a predetermined relationship.

4,056,839

PROTECTIVE RELAY DEVICES

Fumio Andow, Hachioji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 19, 1976, Ser. No. 650,159
Claims priority, application Japan, Jan. 20, 1975, 50-7894
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—68 **11 Claims**



1. A ratio differential relay comprising first and second voltages respectively proportional to the currents at the opposite ends of a section of an electricl power system, each of said converters including a time delay element,

first rectifier means for producing a third voltage proportional to said first voltage,

second rectifier means for producing a fourth voltage proportional to said second voltage,

third rectifier means for producing a fifth voltage proportional to the difference between said first and second voltages,

fourth rectifier means for producing a sixth voltage which is smaller than said fifth voltage and proportional to the difference between said first and second voltages,

a source of constant direct current voltage, means for producing a seventh voltage which is equal to the largest one of the sum of said third and fourth voltages, said sixth voltage and said constant direct current voltage,

a level detector responsive to the difference in the levels of the currents created by said fifth voltage and said seventh voltage,

an OFF delay timer responsive to the output of said level detector,

and an ON delay timer responsive to the output from said OFF delay timer for producing an output for operating said ratio differential relay.

4,056,840

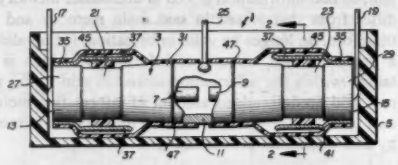
LINE PROTECTOR FOR COMMUNICATIONS CIRCUIT

Paul S. Lundsgaard, and William S. Sedlacek, both of Chicago, Ill., assignors to Reliable Electric Company, Franklin Park, Ill.

Filed May 12, 1976, Ser. No. 685,724
Int. Cl.[2] H02H *3/22*
U.S. Cl. 361—124 **8 Claims**

1. A line protector comprising a gas-filled tube therein, at

least one pair of electrodes separated by insulation and defining an arc gap, connectors electrically insulated from each other and being in respective electrical contact with the electrodes, each connector having an electrically conductive surface external of the gas tube and surrounding the electrodes, a resilient conductive member outside of said tube and having a first part in proximity with a first of said external surfaces and also having a second part in proximity with a second of said external surfaces, the resiliency of said conductive member biasing said conductive member in a direction to effect electrically conductive connection of said external surfaces, said first and



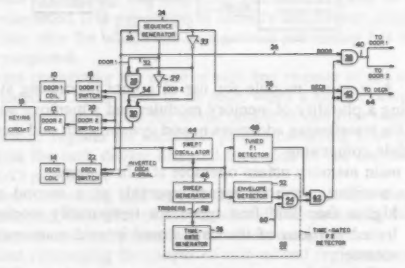
second parts respectively being in substantial surrounding relationship with said first and second surfaces, and a meltable dielectric substance interposed between said conductive member and said tube, said dielectric substance being meltable upon heating due to an overcurrent condition in the tube, said substance being normally engaged by said conductive member to prevent electrically conductive connection of said surfaces except upon melting of said substance so that upon said melting a direct short circuit is provided between said external surfaces over substantial areas of engagement with said member that surrounds said surfaces.

4,056,841

INDUCTIVELY COUPLED KEYABLE CONTROL CIRCUIT AND KEYING CIRCUIT THEREFORE USING HYBRID DETECTION MEANS

Carl E. Atkins, Montclair, and Francis A. McGuirk, Jr., Chatham, both of N.J., assignors to Wagner Electric Corporation, Parsippany, N.J.

Filed Feb. 13, 1976, Ser. No. 657,752
Int. Cl.[2] H01H 47/20; E05B 47/00
U.S. Cl. 361—203 **8 Claims**



1. In an inductively coupled keying circuit for actuating at least one load of the type which includes a swept rf oscillator and an external keying circuit containing at least one resonant circuit having a resonant frequency within the rf swept range of said swept rf oscillator, the invention which comprises:

a. a plurality of sensing coils;

b. switch means for switching the rf energy in sequence to each one of said sensing coils, and for switching off all of the other sensing coils whenever any one coil is switched on;

c. first means for generating a first signal in response to rf absorption in said at least one resonant circuit;

d. second means for generating a second signal in response to rf absorption in said at least one resonant circuit; and

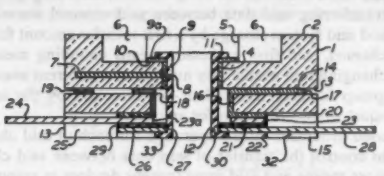
e. means, operative in response to the simultaneous presence of said first and second signals for enabling a control output signal for actuating at least one load.

4,056,842

CERAMIC TRIMMER CAPACITOR

John W. Sienicki, and Clarence A. Haycox, both of Erie, Pa., assignors to Erie Technological Products, Inc., Erie, Pa.

Filed July 8, 1976, Ser. No. 703,668
Int. Cl.[2] H01G 5/06
U.S. Cl. 361—293 **7 Claims**



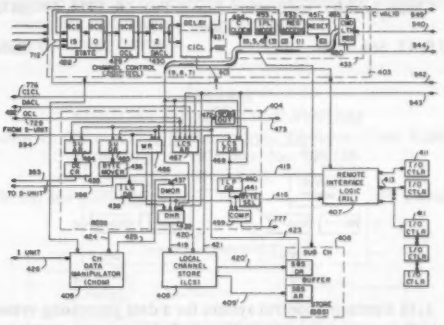
4. In a disc trimmer capacitor of the type having a rotor and a stator each with an electrode, the improvement which comprises a socket in the stator, rotor and stator terminals having apertured heads received in said socket in superposed relation, and means interposed between said heads for insulating the terminals from each other.

4,056,843

DATA PROCESSING SYSTEM HAVING A PLURALITY OF CHANNEL PROCESSORS

Richard L. Bishop, and Steven P. Tulloh, both of Sunnyvale, Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed June 7, 1976, Ser. No. 693,553
Int. Cl.[2] G06F 15/20, 13/00, 3/00
U.S. Cl. 364—200 **14 Claims**



1. A data processing system including system storage and channel unit apparatus for transferring data between input-/output devices and said system storage over a plurality of channels, each channel connected to one or more input/output devices, said channel unit apparatus comprising,

channel store means for storing information including said data to be transferred over said channels,

channel state memory means, storing information for all of said channels, having a plurality of groups of locations, one group for each of said channels where each group stores information for a different associated channel; said state memory means including, for each group, first locations for storing a count to designate a remaining transfer length where the remaining transfer length specifies a number of bytes of said data remaining to be transferred

over the associated channel, second locations for storing a pointer for defining a location in said channel store means, and third locations for storing an availability number specifying the remaining locations in said channel store means,

a first processor means operative for each of said channels to control the transfer of said data between said channel store means and said system storage in response to information in said state memory means for an associated channel, said first processor means including means connected to said state memory means for accessing said first, second and third locations for each channel, including means for transferring said data between said channel store means and said system storage by a first transfer amount for each channel, said first processor means including means for changing said availability number of a different associated group for each channel in one direction by the amount equal to said first transfer amount,

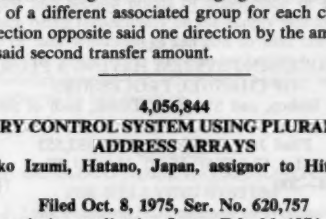
second processor means operative for each of said channels to control the transfer of said data between said channel store means and said input/output devices in response to information in said state memory means for an associated channel, said second processor means including means connected to said state memory means for accessing said first, second and third locations for each channel, including means for transferring said data between said channel store means and said input/output devices by a second transfer amount for each channel, said second processor means including means for changing said availability number of a different associated group for each channel in a direction opposite said one direction by the amount equal to said second transfer amount.

4,056,844

MEMORY CONTROL SYSTEM USING PLURAL BUFFER ADDRESS ARRAYS

Chikahiko Izumi, Hatano, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 8, 1975, Ser. No. 620,757
Claims priority, application Japan, Feb. 26, 1974, 49-22473
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **7 Claims**



1. In a memory control system for a data processing system, which memory control system includes a main memory, a basic processing unit which carries out processing operations with respect to information read-out from and written into said main memory, at least one additional processing unit which also carries out processing operations with respect to information read-out from and written into said main memory, said main memory being adapted to be accessed by said processing units, the improvement wherein at least said basic processing unit comprises

a buffer memory for reading-out and writing-in a predetermined amount of information stored in said main memory;

first register means, coupled to said main memory, for storing the address of said main memory which corresponds to information stored in said buffer memory;

first detector means, coupled to said first register means, for detecting whether or not there is stored in said first register means an address corresponding to an address signal produced within said basic processing unit representative of an address location in said main memory;

second register means, coupled to said main memory, for storing a copy of the contents of said first register means;

second detector means, coupled to said second register means, for detecting the storage address in said main memory into which storage address information is to be written by an additional processing unit; and

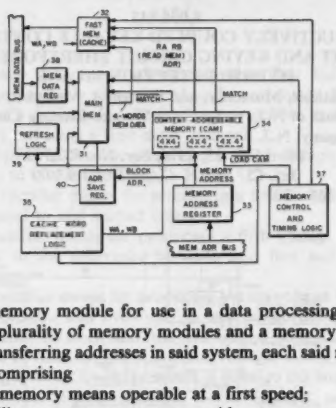
means, coupled to said first and second detector means, and responsive to the writing of information into said storage address of said main memory by said additional processing unit, so that information stored in said buffer memory may differ from that stored in said main memory and may, therefore, no longer be valid information, for invalidating a predetermined amount of information which is contained within the information stored in said buffer memory, said predetermined amount of information including that information which is written into said main memory by said additional processing unit.

4,056,845

MEMORY ACCESS TECHNIQUE

William P. Churchill, Jr., Carlisle, Mass., assignor to Data General Corporation, Southboro, Mass.

Filed Apr. 25, 1975, Ser. No. 571,573
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **10 Claims**



1. A memory module for use in a data processing system having a plurality of memory modules and a memory address bus for transferring addresses in said system, each said memory module comprising

a main memory means operable at a first speed;

an auxiliary memory means operable at a second speed higher than said first speed for temporarily storing selected portions of the data stored in said main memory means;

associative memory means for temporarily storing selected main memory addresses and comparing the stored addresses with an address supplied from said memory address bus to said associative memory means during a read or write operation to generate comparison data for indicating whether data requested by said supplied address is stored in said auxiliary memory means; and

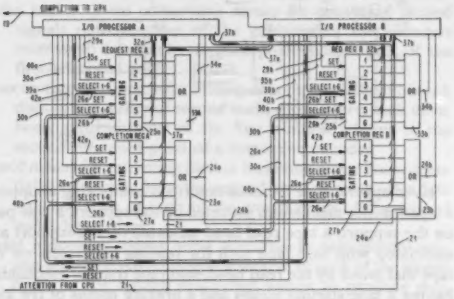
means for storing said selected data portions in said auxiliary memory means so that the data stored in the auxiliary memory means of all of said plurality of memory modules are arranged in an interleaved manner such that data which are expected to be referenced sequentially during the operation of said data processing system are sequentially stored in the auxiliary memory means of different ones of said memory modules.

4,056,846

DATA PROCESSING SYSTEM WITH APPARATUS FOR SHARING CHANNEL BACKGROUND PROCESSING

Robert William Callahan; Paul Eugene Kauffman, both of Endwell; Lawrence Joseph Kobesky, Endicott, and Howard Loomis Page, Apalachin, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,373
Int. Cl.[2] G06F 3/04
U.S. Cl. 364—200 **4 Claims**



1. In a data processing system having a plurality of I/O processors each having a time slice operation with a plurality of time slices for executing portions of channel programs oriented to a particular I/O device for each time slice and one time slice for executing background portions of all channel programs, the improvement comprising,

means connecting each of said I/O processors to receive an attention signal from a central processor for beginning processing by the background time slice of any I/O device,

each of said I/O processors having a first register having a bit position for each device oriented time slice of the associated I/O processor,

means connecting the input of said first register to each of said I/O processors to be set by a background time slice in a bit position identifying one of the device oriented time slices for which background processing has been completed by any background time slice,

means connecting the output of said first register to the associated I/O processor to identify the device oriented time slice for which the background processing has been completed,

means connecting the input of said first register to the associated I/O processor to be reset when a device oriented resource has responded to the output of said first register,

a second register for each I/O processor having a bit position for each device oriented time slice of the associated I/O processor,

means connecting said second register to be set by a device oriented time slice of the associated I/O processor when device oriented processing has been completed,

means connecting the output of said second register to each I/O processor to signal any background time slice that background processing is required by a particular device oriented time slice of the I/O processor and,

means connecting the input of said second register to be reset by any background time slice.

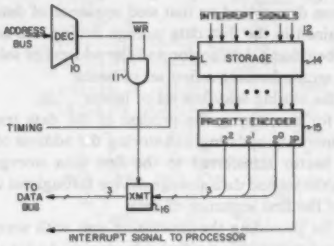
4,056,847

PRIORITY VECTOR INTERRUPT SYSTEM

Angelo Robert Marcantonio, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1976, Ser. No. 771,450
Int. Cl.[2] G06F 9/18
U.S. Cl. 364—200 **1 Claim**

1. In a data processing system capable of handling priority vectored interrupts, said system including means for generating address signals, including address bus means for conducting said address signals, data bus means for conducting data signals, timing signal means for supplying periodic signals, read signal means for supplying signals indicative of system read operations, write signal means for supplying signals representative of system write operations, a plurality of interrupt request signal means for supplying interrupt request signals representative of particular interrupts, each interrupt request signal having an assigned priority, decoder means responsive to said address signals when representative of a particular location for producing a control signal, storage means responsive to said timing signal means for storing the state of each of said plurality of interrupt request signals, priority encoder means responsive to the storage means for producing encoded signals representative of the active interrupt request signal having the highest assigned priority, first gating means responsive to said control signal and said read signal means for coupling said encoded signals to said data bus, the improvement comprising:



second gating means responsive to said control signal and said write signal means for producing a latch signal;

latching means for latching data bus signals in response to said latch signal;

a plurality of third gating means, each responsive to a different one of the latched data bus signals and a different one of said plurality of interrupt request signals, for selectively coupling said interrupt request signals

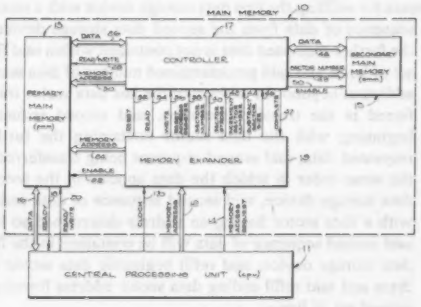
to said storage means.

4,056,848

MEMORY UTILIZATION SYSTEM

George C. Gilley, 21730 Redbeam Ave., Torrance, Calif. 90503

Filed July 27, 1976, Ser. No. 709,139
Int. Cl.[2] G11C 9/06, 7/00
U.S. Cl. 364—200 **19 Claims**



1. A memory utilization apparatus for transferring data sectors between a first data storage device directly accessable to a processing unit of a computing device and a second data storage device accessable to the said processing unit through the first data storage device, comprising:

a first data storage device from which data contained within a data sector is directly accessable by said processing unit;

a second data storage device be transferred to the first data storage device for access by said processing unit;

control means for receiving a request from said processing unit for data and for transferring the data sector containing the requested data from the second data storage device to the first data storage device, said control means further comprising means for automatically transferring a first sequence of data from the second data storage device to the first data storage device, in the same order in which the data appears in the second data storage device, said first sequence beginning with the data sector containing the requested data and ending with a data sector having an address determined so that said sequence of data will be contained in the first data storage device, the address of said beginning data sector and the address of said ending data sector forming a first set of limits;

means for storing said first set of limits;

means for monitoring the process of the data transfer by continuously updating and storing the address of the last data sector transferred to the first data storage device from the second data storage device throughout the transfer of the first sequence of data;

means for providing the processing unit with access to requested data within the first data storage device as soon as the data sector containing the requested data is transferred to the first data storage device;

means for determining whether a data sector containing further requested data by the said processing unit resides within the first data storage device at the time the request is made;

means for providing said processing unit with access to the first data storage device if the data sector containing the further requested data resides within the first data storage device;

means for determining whether the further requested data is within said first set of limits and within a predetermined number of data sector addresses beyond the address of the last data sector transferred in the transfer operation;

means for accessing the further requested data by said processing unit after the data sector containing the further requested data is transferred to the first data storage device if the data sector containing the further requested data is within said first set of limits and within said predetermined number of data sector addresses beyond the address of the last data sector transferred in the transfer operation;

means for refilling the first data storage device with a second sequence of data from the second data storage device if the further requested data is not contained within said first set of limits and said predetermined number of data sector addresses beyond the address of the last data sector transferred in the transfer operation, said second sequence beginning with the data sector containing the further requested data, said second sequence being transferred in the same order in which the data appears in the second data storage device, said second sequence of data ending with a data sector having an address determined so that said second sequence of data will be contained in the first data storage device, said refill beginning data sector address and said refill ending data sector address forming a second set of limits;

means for storing said second set of limits; and,

means for monitoring the progress of the data transfer by continuously updating and storing the address of the last data sector transferred to the first data storage device throughout the transfer of the second sequence of data.

4,056,849

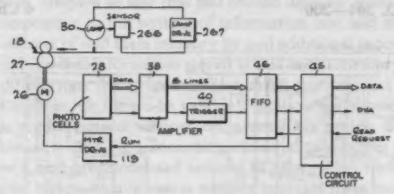
HIGH SPEED BUFFERED TAPE READER WITH LOW TAPE STRESS

Jeffrey M. Bevis, Long Beach, Calif., assignor to Chalco Engineering Co., Gardena, Calif.

Filed Sept. 25, 1975, Ser. No. 616,548

Int. Cl.[2] G06F *13/00*; G06K *7/01, 7/10*; G11B *15/48*

U.S. Cl. 364—900 **27 Claims**



1. An apparatus of the class described comprising a support, a tape transfer mechanism mounted on the support, a tape path on the support, a tape read head mounted on the support and associated with said tape path for reading characters on the tape that move by the read head, said tape transfer mechanism having a tape starting means and a braking means of the kind which operates to gradually stop the tape transfer mechanism and the tape without destructive stresses on the tape whereby when the braking means operates a number of characters on the tape move by the tape read head and are read by it, character storing means operatively associated with said tape read head for storing in sequence any characters on the tape that move by the tape read head when the braking means is gradually bringing the tape transfer mechanism and the tape to a stop, and means connected to the character storing means for recovering the stored characters in the character storing means when operation of the tape transfer mechanism is resumed.

4,056,850

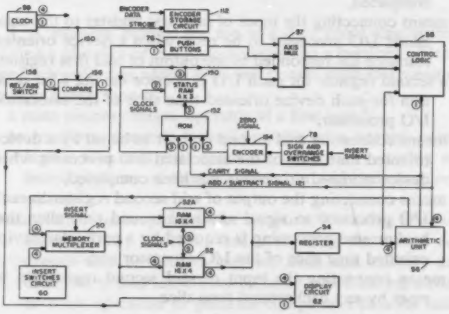
ABSOLUTE RELATIVE POSITION ENCODER PROCESSOR AND DISPLAY

John B. Brown, Lincoln, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Jan. 19, 1976, Ser. No. 650,540

Int. Cl.[2] G05B *19/18*; G06F *15/46*

U.S. Cl. 364—900 **12 Claims**



1. In a system for processing signals from one or more positional encoders, indicating the movement or non-movement thereof, to provide first signals representative of the positions of each of the encoders relative to a first reference point, of the type having:

storage means for storing data representative of each digit of a plurality of multi-digit values, each value being representative of a first position relative to the first reference point of a respective encoder;

means for sequentially retrieving from the storage means the data representative of each of the stored digits;

means responsive to the retrieved data and further responsive to the signals from the encoders for sequentially processing the retrieved data representative of each digit to produce data representative of a plurality of multi-digit values representing a subsequent position relative to the first reference point of each of the encoders; and

means for storing in the storage means the data representative of each of the digits of the multi-digit values representing the subsequent position of each of the encoders;

the improvement comprising means for providing second signals representative of the positions of the encoders relative to a second reference point independent of the first reference point;

second storage means for storing data representative of each digit of a plurality of second multi-digit values, each value being representative of the first position relative to the second reference point of a respective encoder;

said means for retrieving further including means for sequentially retrieving from the second storage means the data representative of each of the stored digits of the second multi-digit values;

said processing means being operative to sequentially process the retrieved data representative of each of the stored digits of the second multi-digit values to produce data representative of a plurality of multi-digit values representing the subsequent position relative to the respective second reference points of each of the encoders and

said means for storing in the storage means further including means for storing in the second storage means the data representative of each of the digits of the multi-digit values representing the subsequent position relative to the respective second reference points of each of the encoders.

4,056,851

ELASTIC BUFFER FOR SERIAL DATA

Norman Hovagimyan, Cherry Hill, and John Michael Link, Westmont, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,915

Int. Cl.[2] G06F *5/06*

U.S. Cl. 364—900 **6 Claims**

1. An elastic buffer for receiving information bits at a rate determined by a receiving clock, and transmitting the information bits at a rate determined by an output clock, where the clocks are not exactly synchronous, comprising

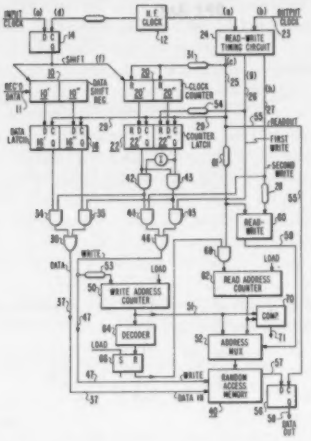
a two-bit data input buffer,

a random access memory,

a read-write memory timing circuit synchronized by said output clock and repeatedly producing a read pulse followed by first and a second spaced write pulses,

a read address counter and a write address counter,

means responsive to said read pulse to read out a bit from said memory at an address determined by the contents of said read address counter, and then increment said counter,



means responsive to said first write pulse and the presence of a first received bit in said two-bit buffer to write said bit into said memory at an address determined by the contents of said write address counter, and then increment said counter, and

means responsive to said second write pulse and the presence of a second received bit in said two-bit buffer to write said bit into said memory at an address determined by the contents of said write address counter, and then increment said counter.

DESIGN PATENTS

GRANTED NOVEMBER 1, 1977

ERRATA

For CLASS	See PATENT NO.
014–036	246,259

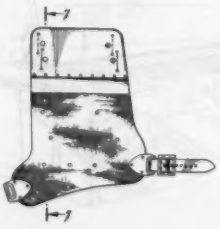
DESIGNS

NOVEMBER 1, 1977

246,206
COMBINED CONFECTION AND HOLDER
Edward Dee, 45 Georgian Court, Elizabeth, N.J. 07200
Filed June 24, 1976, Ser. No. 699,361
Term of patent 14 years
Int. Cl. D1—*1*
U.S. Cl. D1—22

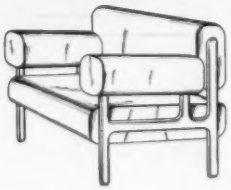
246,207
COMBINED ROTATABLE CONFECTION AND HANDLE
Edward Dee, 45 Georgian Court, Elizabeth, N.J. 07200
Filed Aug. 24, 1976, Ser. No. 717,081
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—22

246,208
ROOFER'S PAD
Moises O. Ruiz, and George Hillinger, both of Los Angeles, Calif., assignors to Action Leathercraft, Inc., Commerce, Calif.
Filed Aug. 14, 1975, Ser. No. 604,701
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27

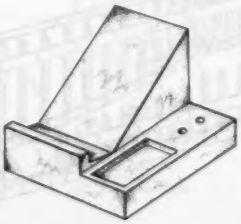


246,209
BELT BUCKLE
Glen D. Burgell, 5132 Washington, St. Joseph, Mich. 49085
Filed Sept. 15, 1975, Ser. No. 613,486
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—427

246,210
SEAT
Aubrey Amey, deceased, late of New York, N.Y., by Greta A. Beckner, administratrix, 2703 Case Road, Columbus, Ohio 43220
Filed May 2, 1975, Ser. No. 574,109
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



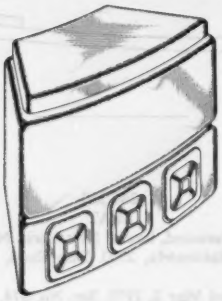
246,211
CALCULATOR SUPPORT STAND
Charles Wayne Sullivan, 3849 Dieckman Lane, Cincinnati, Ohio 45245
Division of Ser. No. 589,869, June 24, 1975. This application Oct. 15, 1976, Ser. No. 732,700
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



246,212
HOUSING FOR A DISPENSER FOR LIQUID SOAP OR THE LIKE

Henry C. Keck, Pasadena; Masao Morisaku, Monterey Park; Irvin O. Anderson, Jr., South Pasadena, all of Calif., and William Roland White, Houston, Tex., assignors to Evolution Health Care Company, Pico Rivera, Calif.

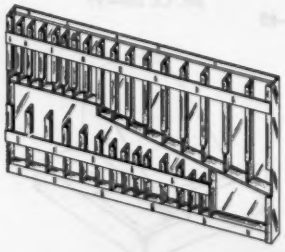
Filed Aug. 5, 1975, Ser. No. 602,145
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95



246,213
DOUBLE DECKER DISPENSER

Ralph S. Ruggiero, Hamden, Conn., assignor to Litton Industrial Products, Inc.

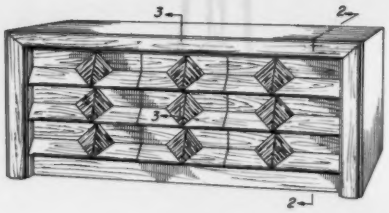
Filed Apr. 5, 1976, Ser. No. 673,821
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



246,214
DRESSER

Max C. Brubaker, Fancy Gap, Va., assignor to Vaughn Bassett Furniture Company, Galax, Va.

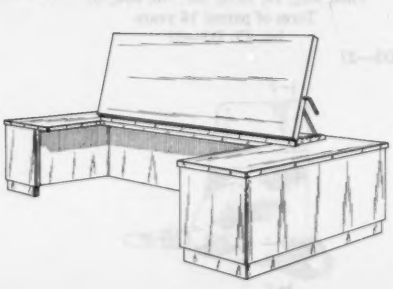
Filed Dec. 22, 1975, Ser. No. 643,129
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—154



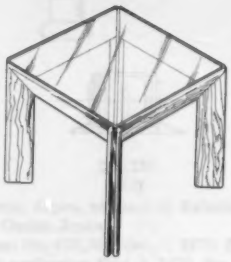
246,215
DRAFTING TABLE

Harry E. Riley, 14 Fennell St., and David O. Chase, E. Lake Road, both of Skaneateles, N.Y. 13152

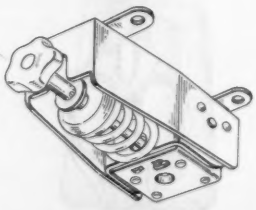
Filed July 18, 1975, Ser. No. 597,107
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—156



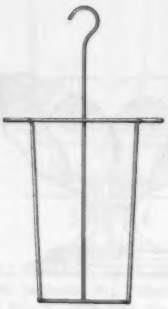
246,216
TABLE
Jules M. Heumann, South San Francisco, Calif., assignor to Metropolitan Furniture Manufacturing Company, South San Francisco, Calif.
Division of Ser. No. 595,564, July 14, 1975. This application Sept. 22, 1976, Ser. No. 725,562
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



246,217
CHAIR CONTROL UNIT
Frank Doerner, 138 Aberdeen Road, Kitchener, Ontario, Canada
Filed Feb. 5, 1976, Ser. No. 655,409
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

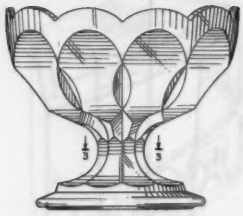


246,218
SHIRT HANGER OR SIMILAR ARTICLE
Arnold Z. Goodman, 360 E. 72nd St., New York, N.Y. 10021
Filed Aug. 25, 1976, Ser. No. 717,562
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—247

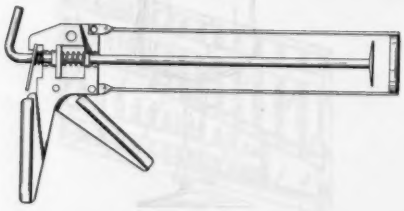


246,219
BEVERAGE GLASS OR SIMILAR ARTICLE
Theodore H. Harbaugh, and Robert C. Malone, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 29, 1975, Ser. No. 644,790
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13

246,220
COMPOTE DISH OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 544,913, Jan. 29, 1975, Pat. No. Des. 243,431, which is a division of Ser. No. 397,069, Sept. 13, 1973, Pat. No. Des. 238,541. This application June 17, 1976, Ser. No. 697,105
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—22



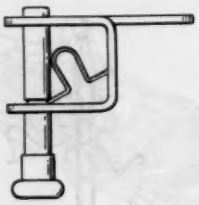
246,221
MASTIC DISPENSING GUN
John Patrick Anthony Cox, Hungerford, England, assignor to P. C. Cox (Mastic Appliances) Limited
Filed Apr. 21, 1976, Ser. No. 678,756
Claims priority, application United Kingdom, Oct. 22, 1975, 972968/75
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14.1



246,222
SPOUT OPENING TOOL
Michael W. Brandt, 1111 W. Mockingbird Lane, Suite 565, Dallas, Tex. 75247
Filed Feb. 2, 1976, Ser. No. 654,353
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—40

246,223
KITCHEN SCISSORS
Toru Hayashi, Seki, Japan, assignor to Hayashi Cutlery Co., Ltd., Osaka, Japan
Division of Ser. No. 553,319, Feb. 26, 1976, Pat. No. Des. 243,650. This application July 21, 1976, Ser. No. 707,693
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—55

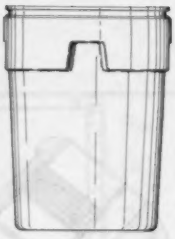
246,224
VENT LOCK
Donald B. Hawkins, P.O. Box 1203, Tracy, Calif. 95376
Filed June 23, 1976, Ser. No. 698,829
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—341



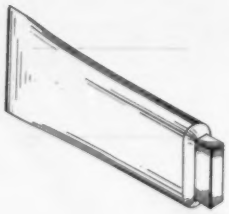
246,225
NUT
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Division of Ser. No. 620,340, Oct. 7, 1975, Pat. No. DES. 242,220. This application Sept. 3, 1976, Ser. No. 720,454
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397

246,226
TONER CONTAINER OR THE LIKE
Donald R. Avolio, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed June 18, 1976, Ser. No. 697,583
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—67

246,227
SHIPPING DRUM OR THE LIKE
Thomas E. Douglas, Statesville, N.C., assignor to Rubbermaid Industrial Products Corporation, Statesville, N.C.
Filed Aug. 29, 1975, Ser. No. 608,824
Term of patent 3½ years
Int. Cl. D9—*02*
U.S. Cl. D9—170

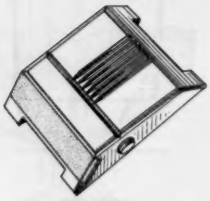


246,228
COMBINED COLLAPSIBLE TUBE AND CAP ASSEMBLY
David E. Hoy, 2100 Jefferson St., Paducah, Ky. 42001
Filed Dec. 1, 1975, Ser. No. 636,459
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—194



246,229
SEAM-FREE CAN BODY
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.
Filed Apr. 4, 1975, Ser. No. 565,093
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—218

246,230
ELECTRONIC DIGITAL WRISTWATCH CASE
Robert F. Sagarino, Wheatley Heights, N.Y., assignor to Bulova Watch Company, Inc., Flushing, N.Y.
Filed Dec. 3, 1975, Ser. No. 637,115
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

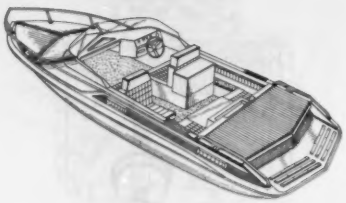


246,231
JEWELRY FINDING
Herman Cernevski, R.R. No. 1 Box 127, Valparaiso, Ind. 46383
Filed Apr. 5, 1976, Ser. No. 673,911
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—1

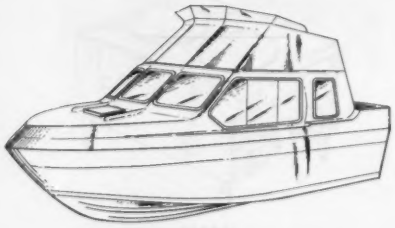
246,232
ARTIFICIAL FLOWER
Susan Kaye Hetherington, 4018 Northridge, Norman, Okla. 73069
Filed Oct. 7, 1976, Ser. No. 730,595
Term of patent 14 years
Int. Cl. D11—*04*
U.S. Cl. D11—117

246,233
ARTIFICIAL FLOWER
Susan Kaye Hetherington, 4018 Northridge, Norman, Okla. 73069
Filed Oct. 7, 1976, Ser. No. 730,480
Term of patent 14 years
Int. Cl. D11—*04*
U.S. Cl. D11—117

246,234
BOATS
Warwick M. Whitley, Austin, Tex., and Arthur E. Carlson, Garden Grove, Calif., assignors to Conroy, Inc., San Antonio, Tex.
Filed Apr. 20, 1976, Ser. No. 678,645
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62

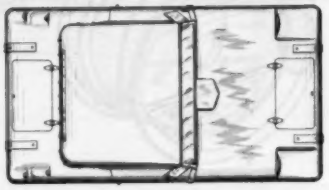


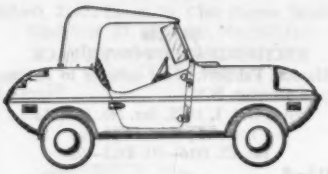
246,235
MOTOR BOAT
David T. Livingston, Seattle, Wash., assignor to Reinell Boats, Inc., Marysville, Wash.
Filed July 15, 1976, Ser. No. 705,452
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—66



246,236
MOTOR BOAT
David T. Livingston, Seattle, Wash., assignor to Reinell Boats, Inc., Marysville, Wash.
Filed July 16, 1976, Ser. No. 705,833
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—66

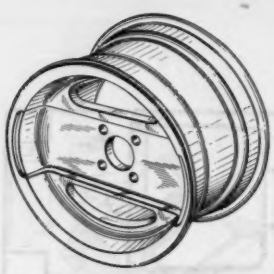
246,237
ELECTRIC CAR
Jack C. Murrill, 5901 Meghan Way, Sacramento, Calif. 95842
Filed Nov. 3, 1976, Ser. No. 738,343
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—92





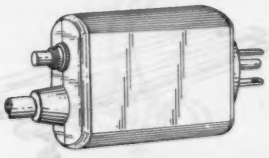
246,238
AUTOMOBILE LUGGAGE RACK
Donald P. Boas, Orange Park, Fla., assignor to Florida Cycle Supply Company
Filed June 3, 1976, Ser. No. 692,613
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

246,239
WHEEL
Edward A. Kozloski, Babylon, N.Y., assignor to Fiat Motors of North America, Montvale, N.J.
Filed Sept. 2, 1976, Ser. No. 719,721
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209



246,240
RECHARGEABLE POWER PACK
David E. Hansen, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 1, 1975, Ser. No. 619,142
Term of patent 14 years
Int. Cl. D16—*05;* D13—*02*
U.S. Cl. D13—8

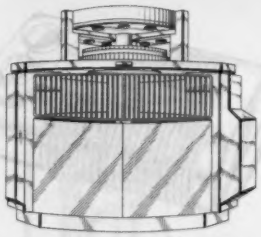
246,241
COMBINATION PLUG AND POWER CUT-OFF UNIT
David A. Jacobs, Brighton, Mich., assignor to JDS Products, Inc., Pontiac, Mich.
Filed Apr. 5, 1976, Ser. No. 673,394
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—28



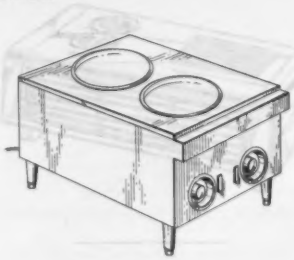
246,242
HEADPHONE
Mario Bellini, Lugano, Switzerland, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Oct. 15, 1975, Ser. No. 622,467
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—36

246,243
PORTABLE CEMENT MIXER
Jon A. Violet, and Hans Hauser, both of Fredericktown, Ohio, assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio
Filed June 28, 1976, Ser. No. 700,514
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—19

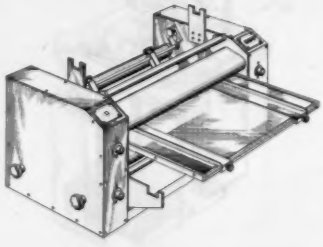
246,244
CIRCULAR KNITTING MACHINE
Wayne Allen Current, Cranford, and Michael Ballone, New Providence, both of N.J., assignors to The Singer Company
Filed Nov. 7, 1975, Ser. No. 629,822
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—66



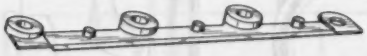
246,245
COMMERCIAL FOOD COOKING DEVICE
Harnek S. Gill, 637 Webster St., Algonquin, Ill. 60102, and Johannes W. Kaebitzsch, 430 Sunset Drive, Crystal Lake, Ill. 60014
Filed Apr. 12, 1976, Ser. No. 675,984
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—104



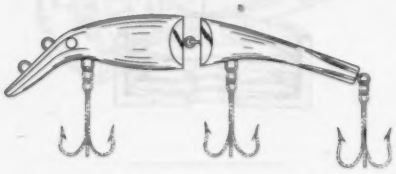
246,246
LAMINATING APPARATUS
Myron W. Shaffer, Irving, Tex., assignor to Thermo Seal, Inc., Fort Worth, Tex.
Filed June 28, 1976, Ser. No. 700,603
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—146



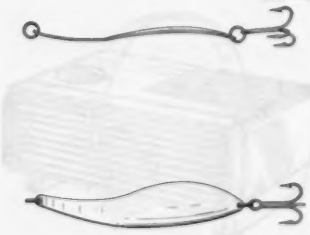
246,247
LATHLIKE ELEMENT FOR SIEVES
Sven Erik Dyrup, Oxie, Sweden, assignor to Trelleborgs Gummifabriks Aktiebolag, Trelleborg, Sweden
Filed Oct. 28, 1975, Ser. No. 626,509
Claims priority, application Sweden, Apr. 29, 1975, 75914
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—147



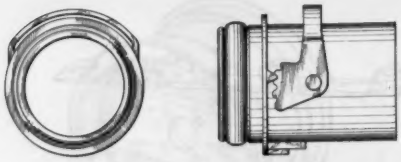
246,248
FISHING LURE
Carl Nothdurft, 22412 Lavon, St. Clair Shores, Mich. 48081
Filed Sept. 27, 1976, Ser. No. 727,211
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



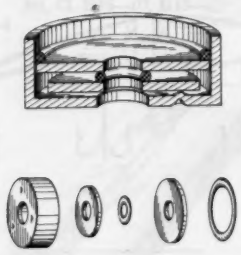
246,249
FISHING LURE
Ilmari Pyorret, Karlskoga, Sweden, assignor to ABU Aktiebolag, Sweden
Filed June 4, 1976, Ser. No. 692,907
Claims priority, application Sweden, Dec. 4, 1975, 752413
Term of patent 7 years
Int. Cl. D22—*05*
U.S. Cl. D22—29



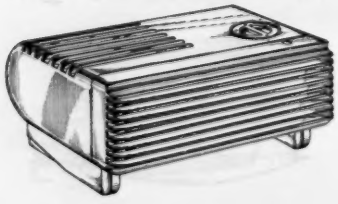
246,250
RECREATIONAL VEHICLE SEWER COUPLING
Robley H. Baldwin, P.O. Box 13286, South Lake Tahoe, Calif. 95702
Filed Sept. 10, 1975, Ser. No. 612,178
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



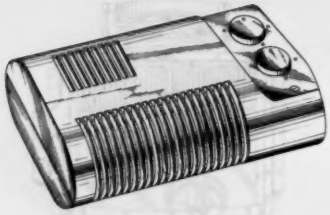
246,251
VACUUM BREAKER FOR VALVE STEM PACKING
Elder F. Hirsch, 520 - 21st St., and Ronald F. Hirsch, 707 E. 20th St., both of Greeley, Colo. 80631
Filed Oct. 14, 1975, Ser. No. 621,689
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—47



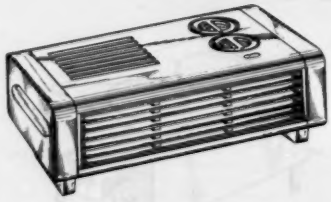
246,252
HEATER
Hans-Ulrich Schade, Pfuhl, Germany, assignor to Firma Elektro-Warme Technik, Nurnberg, Germany
Filed Aug. 8, 1975, Ser. No. 603,179
Claims priority, application Germany, Feb. 13, 1975, 1147
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—122



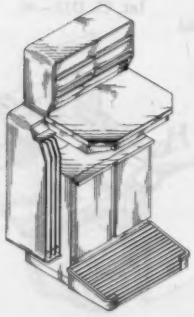
246,253
HEATER
Hans-Ulrich Schade, Pfuhl, Germany, assignor to Firma Elektro-Warme Technik, Nurnberg, Germany
Filed Aug. 8, 1975, Ser. No. 604,612
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—122



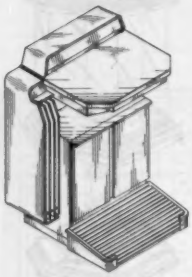
246,254
HEATER
Hans-Ulrich Schade, Pfuhl, Germany, assignor to Firma Elektro-Warme Technik, Nurnberg, Germany
Filed Aug. 8, 1975, Ser. No. 603,180
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—122



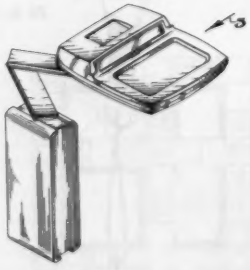
246,255
DENTAL CONSOLE
Danny Michael Truette, Pineville, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.
Filed Nov. 12, 1976, Ser. No. 741,361
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—4



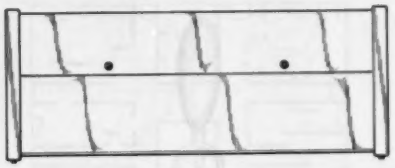
246,256
DENTAL CONSOLE
Danny Michael Truette, Pineville, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.
Filed Nov. 12, 1976, Ser. No. 741,364
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—4

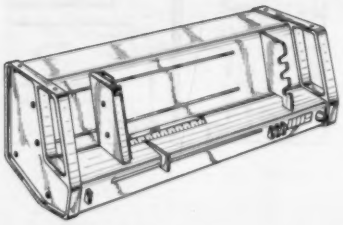


246,257
DENTAL CONSOLE
Danny Michael Truette, Pineville, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.
Filed Nov. 12, 1976, Ser. No. 741,516
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—4



246,258
INFUSION PUMP
Roland Ekert, Burghaldenstrasse 52, 7032 Sindelfingen, Germany
Filed Dec. 31, 1975, Ser. No. 645,883
Claims priority, application Germany, July 4, 1975, 601
Term of patent 14 years
Int. Cl. D24—*01*; D15—*02*
U.S. Cl. D24—8





246,259
HEAD PHONE
Yasutake Nishimura, Hirakata, and Mitsuhiro Hasagawa, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Dec. 10, 1975, Ser. No. 639,511
Claims priority, application Japan, June 20, 1975, 50-25251
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—36

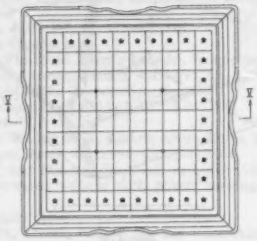
246,260
HAIR COLOR APPLICATOR
Lynne Forrester, 736 Guthrie Ave., Des Moines, Iowa 50316
Filed Feb. 9, 1976, Ser. No. 656,210
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

246,261
ELECTRIC DRY SHAVER
Jacob Anthony Krapowicz, Fairfield, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.
Filed Jan. 12, 1976, Ser. No. 648,186
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49

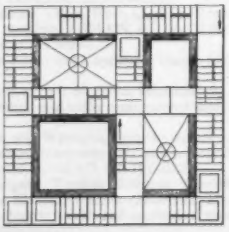
246,262
COMBINED AQUARIUM AND STAND
Ralph A. Zupo, 1818 Coronado Ave., Youngstown, Ohio 44504
Filed Oct. 22, 1976, Ser. No. 735,109
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—8

246,263
GAME PADDLE
Lindsey G. Spivey, II, Dallas, Tex., assignor to Jokari/US, Inc., Dallas, Tex.
Filed May 6, 1976, Ser. No. 683,717
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SP

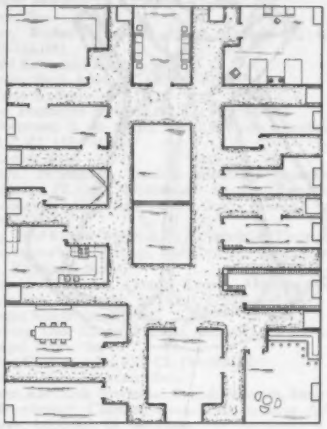
246,264
GAME BOARD
Satashi Hasegawa, and Mitsuo Tsukuda, both of 6-506 Keyaki-dai-danchi, 1-13-2 Wakaba-cho, Tachikawa, Tokyo, Japan
Filed Jan. 26, 1976, Ser. No. 652,084
Claims priority, application Japan, July 24, 1975, 5030522
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



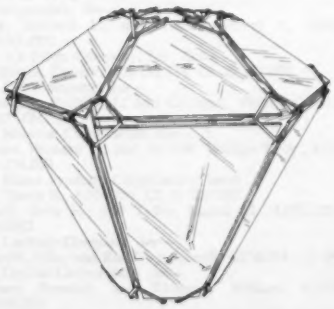
246,265
GAME BOARD
Jack Warren Wood, 238 22nd St., Costa Mesa, Calif. 92627
Filed Feb. 2, 1976, Ser. No. 654,401
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



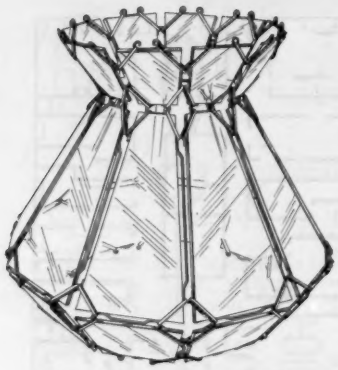
246,266
GAMEBOARD
Dian McIntosh, 28835 Pierce Ave., Barston, Calif. 93702
Filed Feb. 13, 1976, Ser. No. 657,743
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



246,267
LAMP SHADE
John Geoffrey Baker, Willowdale, Canada, assignor to Baker-Martin Enterprises Limited
Filed Jan. 21, 1977, Ser. No. 761,360
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 R

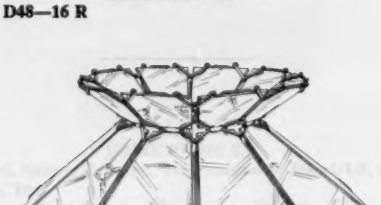


246,268
LAMP SHADE
John Geoffrey Baker, Willowdale, Canada, assignor to Baker-Martin Enterprises Limited
Filed Jan. 21, 1977, Ser. No. 761,384
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 R



246,269
LAMP SHADE
John Geoffrey Baker, Willowdale, Canada, assignor to Baker-Martin Enterprises Limited
Filed Jan. 21, 1977, Ser. No. 761,385
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 R

246,270
LAMP SHADE
John Geoffrey Baker, Willowdale, Canada, assignor to Baker-Martin Enterprises Limited
Filed Jan. 21, 1977, Ser. No. 761,386
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 R



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TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF NOVEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Pierburg Autogeratebau KG: *See*—
Baumgartner, Hans, 4,056,084, Cl. 123-119.00A.

A.S.A. S.A.: *See*—
Bourgeois, Norbert Paul, 4,055,968, Cl. 66-151.000.

A. Stephan U. Sohne GmbH & Co.: *See*—
Otto, Friedrich, 4,056,640, Cl. 426-573.000.

AB Akerlund & Rausing: *See*—
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AB Bofors: *See*—
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Abbou, Clement Claude: *See*—
Rey, Pierre Theodore Joseph; Leandri, Jacqueline Agathe Marie; and Abbou, Clement Claude, 4,056,095, Cl. 128-1.00R.

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Ackermann, Walter Thomas; and Martins, Jeremias Anthony, to Scovill Manufacturing Company. Slider for invisible-type slide fastener. 4,055,876, Cl. 24-205.14R.

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Tooley, Jack Raymond, 4,056,254, Cl. 249-210.000.

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Trenkamp, Robert H.; and Dissauer, Gerald A., 4,056,712, Cl. 235-440.000.

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Krafft, Werner; Wolff, Erich; and von Bonin, Wulf, 4,056,397, Cl. 96-77.000.
Mischo, Klaus, 4,056,319, Cl. 355-68.000.
Schneider, Siegfried; Thate, Kurt; Geyken, Erwin; Kempe, Horst; and Macher, Stephan, 4,055,879, Cl. 29-123.000.

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Imabuchi, Yoshihisa; Kurami, Kenshi; Akiyama, Yoshinori; and Sobajima, Katsunobu, 4,056,271, Cl. 280-745.000.

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Decobert, Jacques L. E., 4,056,230, Cl. 241-15.000.

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Hixenbaugh, Dennis L., 4,056,374, Cl. 55-377.000.

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Janin, Pierre R., 4,056,359, Cl. 23-259.000.
Sellstedt, John H.; and Teller, Daniel M., 4,056,525, Cl. 260-239.0BD.

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Grolman, Bernard; and Richards, William, 4,055,900, Cl. 33-200.000.
Winthrop, John Talley, 4,056,311, Cl. 351-169.000.

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Sipin, Richard F., 4,056,426, Cl. 156-505.000.

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Hansen, Charles D., Jr., 4,056,463, Cl. 209-111.70R.
Ray, Eric Thomas, 4,056,022, Cl. 83-62.000.

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Hoffman, Werner; Mueller, Norbert; and von Fraunberg, Karl, 4,056,541, Cl. 260-343.000.
Hoffmann, Werner; and Baumann, Manfred, 4,056,545, Cl. 260-410.000.
Schoettle, Klaus; Wittkamp, Heinrich; and Gliniorz, Lothar, 4,056,245, Cl. 242-197.000.
Strehler, Hugo; Beer, Ludwig; Heil, Eduard; Urbanek, Friedrich; and Fischer, Hermann, 4,056,514, Cl. 260-75.00R.

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Baskovic, Franz: *See—*
Hoeger, Ernst; and Baskovic, Franz, 4,056,430, Cl. 162-76.000.

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Arieh, Simon; and Budliger, Jean-Pierre, 4,056,002, Cl. 73-194.00R.

Bau, Marcel; Hinkes, Larry D.; and Cosgrave, James. Scoop device. 4,056,278, Cl. 294-19.00R.

Bauer, Andreas; and Lange, Wolfgang, to Volkswagenwerk Aktiengesellschaft. Door for vehicles, in particular motor vehicles. 4,056,280, Cl. 296-146.000.

Bauer, Johann, to Siemens Aktiengesellschaft. Housing for securing a damping compression spring in an electromagnetic switching apparatus. 4,056,799, Cl. 335-277.000.

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Baumgartner, Hans, to A. Pierburg Autogeratebau KG. Method and apparatus for recycling exhaust. 4,056,084, Cl. 123-119.00A.

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Sonderegger, Hans Conrad; and Baumgartner, Hans Ulrich, 4,056,009, Cl. 73-406.000.

Bauml, Kurt; Gunsser, Otto Ch.; and Lohse, Rudolf K., to Gebruder Heller Maschinenfabrik GmbH. Device for machining winding slots of generator rotors. 4,056,039, Cl. 90-92.000.

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Carter, Garry L.; and Granzow, Daniel B., 4,056,116, Cl. 137-68.00R.
Geissler, Ulrich C.; and Stith, William J., 4,056,101, Cl. 128-214.00D.
Lolachi, Houshang, 4,056,224, Cl. 233-14.00R.
Priarone, Paolo; and Achter, Eugene K., 4,056,358, Cl. 23-253.00R.
Soodak, Charles; and Gelbman, Alexander, 4,056,708, Cl. 219-499.000.

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Alberts, Heinrich; Bartl, Herbert; and Prinz, Richard, 4,056,671, Cl. 526-342.000.
Eichenhofer, Kurt-Wilhelm; and Schliebs, Reinhard, 4,056,469, Cl. 210-62.000.
Germerdonk, Rolf; Jonas, Adam; Hullstrung, Dieter; and Scherhag, Bernhard, 4,056,606, Cl. 423-575.000.
Grundmeier, Manfred; Binsack, Rudolf; and Vernaleken, Hugo, 4,056,504, Cl. 260-37.0PC.
Heinze, Gerhard; Mengel, Manfred; and Reiss, Gerhard, 4,056,370, Cl. 55-68.000.
Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, 4,056,544, Cl. 260-378.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,056,533, Cl. 548-360.000.
Muschelknautz, Edgar; and Nemecek, Franz, 4,055,940, Cl. 57-77.400.
Schlee, Hans Georg; Sasse, Klaus; and Eue, Ludwig, 4,056,527, Cl. 544-194.000.
Weicht, Bodo; and Kleinhenz, Karl, 4,056,444, Cl. 203-26.000.
Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, 4,056,564, Cl. 260-512.00C.

Bayer, Horst O.; and Hurt, William S., to Rohm and Haas Company. Process for the preparation of phosphorodichloridothiolates. 4,056,581, Cl. 260-972.000.

Bayern-Chemie Gesellschaft fur flugchemische Antriebe mit beschrankter Haftung: *See—*
Herrmann, Guenter, 4,056,242, Cl. 242-107.40R.

Bayha, Jack E., to ARDAC/USA. Reticle protective structure and radiation sensitive validation apparatus. 4,056,731, Cl. 250-556.000.

BBC Brown Boveri & Company Limited: *See—*
Meloni, Beat, 4,056,332, Cl. 416-97.00A.
Meyer, Gundolf, 4,055,887, Cl. 29-599.000.

Beach, Anthony John; Eveson, Geoffrey Frank; and Leedham, Reginald Keith, to Laporte Industries Limited. Process and apparatus for heating gases. 4,056,704, Cl. 219-121.00P.

Beall, Benjamin S., III; and Novy, Russell F., to Sola Basic Industries, Inc. Electric heating furnace. 4,056,678, Cl. 13-25.000.

Beatrice Foods Co.: *See—*
Chow, Ho, 4,056,582, Cl. 261-30.000.

Beaver, Emil R., Jr. Inexpensive and disassemblable structural units. 4,055,924, Cl. 52-262.000.

Bechtel International Corporation: *See—*
Fox, Joseph M., III; Degen, Bruce D.; and Leibson, Irving, 4,056,599, Cl. 423-178.000.

Beck, Gerhard: *See—*
Bartmann, Wilhelm; Beck, Gerhard; Granzer, Ernold; Musil, Josef; and Teufel, Hermann, 4,056,629, Cl. 424-327.000.

Becker, Otto Alfred. Load bearing construction unit. 4,055,920, Cl. 52-2.000.

Becklund, Orville A., to Texas Instruments Incorporated. Proximity fuse. 4,056,061, Cl. 102-70.20P.

Beecham Group Limited: *See—*
Clark, Judith Ann, 4,056,630, Cl. 424-330.000.

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Beery, Jack, to Burroughs Corporation. Ribbonless endorser having a shiftable inked platen and feed roller. 4,056,183, Cl. 197-1.00R.

Behr, Friedrich F., to Rheinische Braunkohlenwerke AG. Thermochemical process for the production of hydrogen and oxygen from water. 4,056,607, Cl. 423-579.000.

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Heimburger, Norbert; Sieber, Axel; and Schwinn, Horst, 4,056,484, Cl. 252-408.000.
Weiler, Herbert; Schneider, Hans; and Weyrich, Ludwin, 4,056,129, Cl. 141-24.000.

Belanger, Inc.: *See—*
Belanger, James A., 4,055,919, Cl. 51-334.000.

Belanger, James A., to Belanger, Inc. Pack unit and mounting means therefor. 4,055,919, Cl. 51-334.000.

Belanger, Patrice C.: *See—*
Atkinson, Joseph G.; Belanger, Patrice C.; Rooney, Clarence S.; and Britcher, Susan F., 4,056,536, Cl. 260-326.50B.

Bell & Howell Company: *See—*
Sample, Winfield, 4,056,008, Cl. 73-398.0AR.

Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., to Colt Industries Operating Corporation. Electrical discharge machining power circuit. 4,056,702, Cl. 219-69.00C.

Bell Telephone Laboratories, Incorporated: *See—*
Angner, Ronald Joseph; and Lacy, James Volney, 4,056,695, Cl. 179-99.000.
Bobeck, Andrew Henry; and Fischer, Robert Frederick, 4,056,812, Cl. 365-17.000.
Bobeck, Andrew Henry; and Scovil, Henry Evelyn Derrick, 4,056,814, Cl. 365-8.0TF.
Bosik, Barry Sheldon; and Stone, Dale Eugene, 4,056,693, Cl. 179-84.00R.
Brolin, Stephen Joseph; and Colodner, Samuel, 4,056,690, Cl. 179-17.00A.
Brolin, Stephen Joseph, 4,056,694, Cl. 179-84.00R.
Dworak, Francis Stanislaus; and Ratti, Renald Anthony, 4,056,698, Cl. 179-175.20C.
Freimanis, Laimons, 4,056,689, Cl. 179-16.00F.
Freimanis, Laimons; Mussman, Harry Edward; and Smith, DeWitt Paul, 4,056,691, Cl. 179-18.0FA.
Meyerle, John Alfons; and Stokes, Rembert Ryan, 4,056,696, Cl. 179-100.00R.
Peterson, William Anders, 4,056,734, Cl. 307-254.000.
Sequin, Carlo Heinrich, 4,056,737, Cl. 307-304.000.
Stiefel, Kenneth Erwin, 4,056,688, Cl. 179-16.00F.
Swan, Clarence Burke, 4,056,785, Cl. 330-53.000.
Thornber, Karvel Kuhn, 4,056,807, Cl. 340-166.00R.
Waaben, Sigurd Gunther, 4,056,719, Cl. 250-199.000.

Belov, Vladimir Nikolaevich: *See—*
Volfkovich, Semen Issakovich; Belov, Vladimir Nikolaevich; Ershov, Vadim Andreevich; Rozenberg, Evgeny Khaskelevich; Shipov, Emmanuil Ivanovich; and Jumanova, Ljudmila Vladimirovna, 4,056,601, Cl. 423-322.000.

Benckiser-Knapsack GmbH: *See—*
Hoeger, Ernst; and Baskovic, Franz, 4,056,430, Cl. 162-76.000.

Bendix Corporation, The: *See—*
McNabb, Vernon L., 4,056,125, Cl. 137-625.300.

Benhamou, Jean Pierre, to Texas Instruments Incorporated. Ultrasonic remote control receiver suitable for TV receiver. 4,056,808, Cl. 340-171.0PF.

Bennett, George Robert, to Molins Limited. Apparatus for unloading rod-like articles from containers. 4,056,206, Cl. 214-302.000.

Bennett, Joseph C.: *See—*
Fusco, Vito A.; Bennett, Joseph C.; Funcik, Jack F.; Kufner, Kenneth L.; and Schneider, Thomas E., 4,055,889, Cl. 29-710.000.

Bent, Alfred H.; Booth, George J.; and Perregrino, Anthony. Textile finishing. 4,056,353, Cl. 8-14.000.

Bentz, Francis: *See*—
Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, 4,056,564, Cl. 260-512.00C.

Berger, Eugene; Gerard, Pol; Delbouille, Andre; and Deroitte, Jean-Louis, to Solvay & Cie. Process for the polymerization and copolymerization of olefins with a solid support catalyst. 4,056,668, Cl. 526-124.000.

Bergstrom, Lars Rune. System for trimming the mast of a sailing yacht. 4,056,072, Cl. 114-109.000.

Bergwerksverband GmbH: *See*—
Kamann, Gunther; Krahe, Jurgen; Zischinsky, Ulf; and Gotze, Wilhelm, 4,056,036, Cl. 85-63.000.

Berk, Charles W.; and Vallance, Charles B., to Leco Corporation. Electrode system for resistance furnace. 4,056,677, Cl. 13-23.000.

Berkovich, Viktor Mozesovich: *See*—
Bukrinsky, Anatoly Matveevich; Matskevich, Genrikh Vladimirovich; Rzheznikov, Julian Vulfovich; Sukhov, Andrei Borisovich; Tatarnikov, Viktor Petrovich; Berkovich, Viktor Mozesovich; Remzhin, Jury Nikolaevich; Slepnev, Lev Nikolaevich; Sverdlov, Alexandr Anatolievich; Karan, Vladimir Geselevich; Kaloshin, Jury Petrovich; Krasikov, Anatoly Nikolaevich; Babenko, Evgeny Akimovich; Bronnikov, Vladimir Konstantinovich; Shvyryaev, Jury Vasilievich; and Shiryaev, Boris Semenovich, 4,056,436, Cl. 176-38.000.

Bernard, Jean Paul; and Meningand, Paul A., to Aerazur Constructions Aeronautiques. Aircraft arresting gear net raising device. 4,056,247, Cl. 244-110.00C.

Bertazzoli, Cesare; Sala, Luisa; and Ghione, Mario, to Societa Farmaceutici Italia S.p.A. Method of reducing the cardiotoxic side effects of glycosidic anthracyclinones. 4,056,613, Cl. 424-94.000.

Bertram, Heidrun; Fahnestich, Rudolf; and Hesse, Joachim, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Food and fodder additive. 4,056,658, Cl. 426-2.000.

Best, Freddie W.: *See*—
Schumacher, Joseph N.; Best, Freddie W.; and Green, Charles R., 4,056,108, Cl. 131-17.00R.

Best, Walter E. Equipment lock. 4,055,973, Cl. 70-58.000.

Bevington, Richard C.; and Snee, David J., to Gibson Electric, Inc. Silver electrical contact materials and method of making. 4,056,365, Cl. 428-565.000.

Bevis, Jeffrey M., to Chalco Engineering Co. High speed buffered tape reader with low tape stress. 4,056,849, Cl. 364-900.000.

Beyersdorf, Hartwig, to GEBA, Gesellschaft fuer Brandmeldeanlagen mbH & Co. Attachment means of an object to a support. 4,056,727, Cl. 250-385.000.

Bianchi, Giuseppe: *See*—
de Nora, Vittorio; Nidola, Antonio; and Bianchi, Giuseppe, 4,056,449, Cl. 204-106.000.

Biebuyck, Lawrence F., to Howmet Corporation. Wall framing system and components thereof. 4,055,923, Cl. 52-235.000.

Bien, Hans-Samuel: *See*—
Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, 4,056,544, Cl. 260-378.000.

Bierbach, Herbert: *See*—
Baron, Gerhard; Bierbach, Herbert; Hafke, Carl; and Pockrandt, Gunter, 4,056,483, Cl. 252-373.000.

Billings Energy Research Corporation: *See*—
Campbell, Barrie C., 4,056,452, Cl. 204-258.000.

Bilodeau, Luc Andre, to Celanese Canada Limited. Apparatus for uniformly unwinding a yarn package. 4,056,243, Cl. 242-128.000.

Binsack, Rudolf: *See*—
Grundmeier, Manfred; Binsack, Rudolf; and Vernaleken, Hugo, 4,056,504, Cl. 260-37.0PC.

Bishop, Richard L.; and Tulloh, Steven P., to Amdahl Corporation. Data processing system having a plurality of channel processors. 4,056,843, Cl. 364-200.000.

Black, Robin Michael, to John Wyeth & Brother Limited. Dibenzopyrimidoazepines. 4,056,529, Cl. 260-251.00A.

Blafford, Antoinette: *See*—
Blafford, Clem; and Blafford, Antoinette, 4,056,078, Cl. 119-158.000.

Blafford, Clem; and Blafford, Antoinette. Automatic dog washer. 4,056,078, Cl. 119-158.000.

Blair, Calvin B. Multiple section farm implement with adjustable latch arrangement. 4,056,148, Cl. 172-311.000.

Blanchard, James S.; and Kapper, Charles E., to P. R. Mallory & Co. Inc. Noise dampening means for a permanent magnet synchronous motor. 4,056,744, Cl. 310-51.000.

Blatt, Victor, to Plessey Handel und Investments A.G. Injection logic arrangements. 4,056,736, Cl. 307-289.000.

Blau KG Fabrik fur Kraftfahrzeugteile: *See*—
Gerdes, Theodor, 4,056,121, Cl. 137-541.000.

Bleeck, Heinz: *See*—
Latus, Hans; Hemala, Zdenek; Bleeck, Heinz; and Weber, Rolf Dieter, 4,055,937, Cl. 57-34.00R.

Bloom, Harvey J.: *See*—
LaWhite, Eric L.; Henrichon, Ernest G., Jr.; and Bloom, Harvey J., 4,056,263, Cl. 271-3.000.

Blum, Rudolf: *See*—
Dinkelacker, Walter; Blum, Rudolf; Abele, Klaus; Knodler, Jurgen; and Ebinger, Peter, 4,055,996, Cl. 73-117.000.

Bobb, Lloyd C.; and Kramer, Kimball, to United States of America, Army. Method of changing the frequency of a laser beam. 4,056,290, Cl. 307-88.300.

Bobbitt, Jesse L.; and Smithwick, Edward L., Jr., to Eli Lilly and Company. Substrate for assay of plasmin. 4,056,519, Cl. 260-112.50R.

Bobeck, Andrew Henry; and Fischer, Robert Frederick, to Bell Telephone Laboratories, Incorporated. Fault tolerant magnetic bubble memory. 4,056,812, Cl. 365-17.000.

Bobeck, Andrew Henry; and Scovil, Henry Evelyn Derrick, to Bell Telephone Laboratories, Incorporated. Magnetoresistive element for detecting magnetic bubbles. 4,056,814, Cl. 365-8.0TF.

Boehm, William S.: *See*—
Likens, Robert; and Boehm, William S., 4,056,130, Cl. 141-67.000.

Bokelmann, Horst, to Metzeler Schaum GmbH. Process for producing foam slabs of rectangular cross-section. 4,056,595, Cl. 264-46.300.

Bolanos, Jaime: *See*—
Pollock, Douglas; Sobarzo, Omar; Urquizar, Rolando; Vilches, Carlos; and Bolanos, Jaime, 4,056,262, Cl. 266-138.000.

Bom, Cornelis Johannes Gerardus: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,056,147, Cl. 172-68.000.

Bonafos, Raymond, to Societe Nationale Elf Aquitaine (Production). Emergency elevator. 4,056,167, Cl. 182-10.000.

Bonneau, Gustave: *See*—
Lahourcade, Bernard; and Bonneau, Gustave, 4,056,513, Cl. 260-62.000.

Bonneau, Marc; and Latour, Mirelle. Immunity depressant medicine. 4,056,614, Cl. 424-105.000.

Booth, George J.: *See*—
Bent, Alfred H.; Booth, George J.; and Perregrino, Anthony, 4,056,353, Cl. 8-14.000.

Born, Ellis H.; Meisel, William H.; and Viles, Alan H., to ABEX Corporation. Control system for axial piston fluid energy translating device. 4,056,041, Cl. 91-375.00R.

Bosch, Paul: *See*—
Zorn, Jurgen; Vlemmings, Jan; Muller, Karl-Heinz; Mayer, Siegfried; Dworak, Wilhelm; Hartmann, Eugen; Fader, Martin; Talmon, Wolfgang; Jons, Claus; Sauer, Ivan; and Bosch, Paul, 4,056,337, Cl. 418-131.000.

Boserup, Hans C., to Danly Machine Corporation. Transfer and turnover mechanism for use with power press or the like. 4,056,198, Cl. 214-1.0BC.

Bosik, Barry Sheldon; and Stone, Dale Eugene, to Bell Telephone Laboratories, Incorporated. Voltage and current controlled converter for telephone ringing. 4,056,693, Cl. 179-84.00R.

Bottomley, Herbert Geoffrey, to Landis Lund, Limited. Transversely removable gantry loader. 4,056,064, Cl. 104-93.000.

Boudigues, Serge, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Multiflow gas turbine power plant. 4,055,949, Cl. 60-269.000.

Bourdeau, Romeo G.: *See*—
Galasso, Francis S.; Bourdeau, Romeo G.; and Pike, Roscoe A., 4,056,598, Cl. 264-184.000.

Bourgeois, Norbert Paul, to A.S.A. S.A. Drive arrangement for windup apparatus in a circular knitting machine. 4,055,968, Cl. 66-151.000.

Boutillette, Arthur A. Parts washer and filter assembly therefor. 4,056,114, Cl. 134-104.000.

Bowe Bohler & Weber KG Maschinenfabrik: *See*—
Wanner, Rudolf, 4,055,932, Cl. 53-63.000.

Bowie, Raymond Alexander; Cox, John Michael; Farrell, Gordon Michael; and Shephard, Margaret Claire, to Imperial Chemical Industries Limited. Pesticidal dihydrotetrazolo [1,5-a] quinazolines and pesticidal uses thereof. 4,056,384, Cl. 71-92.000.

Bowmar Instrument Corporation: *See*—
Weber, John E., 4,056,701, Cl. 200-314.000.

Boyadzhian, Varazdat Karapetovich; Khachatrian, Saribek Saakovich; Stepanian, Genrikh Gevorkovich; Eritsian, Volodya Karapetovich; Agavelian, Edik Stepanovich; Nefedov, Oleg Matveevich; Dolgy, Igor Evgenievich; Sisin, Mikhail Fedorovich; Kolbasin, Alexei Yakovlevich; and Anikeev, Ivan Konstantinovich. Method of producing allylacetate. 4,056,563, Cl. 560-245.000.

Boyce, Leonard D., to Burgess, F. Travers. Two-fuel carburetor. 4,056,087, Cl. 123-127.000.

Boyle, Patrick T., to Maryland Cup Corporation. Splash proof drink through beverage container lid. 4,056,210, Cl. 220-90.400.

Bradford, Jay H.; and Terp, Norman T., to Eaton Corporation. Syphon tube and vent valve assembly. 4,056,118, Cl. 137-201.000.

Bradley, Gerald Arthur: *See*—
Harbison, Robert Campbell; Bradley, Gerald Arthur; and Lux, Paul Arthur, 4,056,309, Cl. 350-310.000.

Brady, William M. Programmable electronic visual display systems. 4,056,805, Cl. 340-148.000.

Bralander, Borje; Claesson, Ake; Henningsson, Lars-Erik; and Scheel, Johan, to Centro-Maskin Goteborg AG. Grinding machine. 4,055,918, Cl. 51-47.000.

Brandenberger, Stanley G.: *See*—
McClure, James D.; and Brandenberger, Stanley G., 4,056,578, Cl. 260-683.470.

Brandt, Thomas F.; Netzel, Philip C.; and Wharton, Lennard, to I-T-E Imperial Corporation. Sodium filled flexible transmission cable. 4,056,679, Cl. 174-13.000.

Braun, Daniel E.; and Bruener, Patrick J., to Briggs & Stratton Corporation. Means for facilitating checking and replenishment of crankcase oil in a small engine. 4,055,898, Cl. 33-126.40R.

Braun, Roland Joseph; and von Voss, William Ditlef, to International Business Machines Corporation. Electrical connection structure and method. 4,056,302, Cl. 339-275.00B.

Brauning, Egon, to Fehlbaum. Supporting framework for shelves. 4,056,196, Cl. 211-207.000.

Braunschweigische Maschinenbauanstalt: *See*—
Sander, Hanslothar; Matusch, Siegfried; and Hemminghaus, Uwe, 4,056,475, Cl. 210-402.000.

Breiter, Joachim; and Helger, Roland, to Merck Patent Gesellschaft mit beschrankter Haftung. Isolation of component materials of aqueous solutions soluble in lipophilic solvents. 4,056,468, Cl. 210-31.00R.
Bresler and Associates, Inc.: *See*—
Bresler, Sidney A., 4,056,603, Cl. 423-359.000.
Bresler, Sidney A., to Bresler and Associates, Inc. Process for increasing ammonia production. 4,056,603, Cl. 423-359.000.
Bridwell, Willie Earl, to Kapsura, Inc. Liquid gauge assembly. 4,055,991, Cl. 73-73.000.
Brieaddy, Lawrence Edward: *See*—
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, 4,056,632, Cl. 424-330.000.
Briggs & Stratton Corporation: *See*—
Braun, Daniel E.; and Bruener, Patrick J., 4,055,898, Cl. 33-126.40R.
Bristol-Myers Company: *See*—
Buchanan, Ronald Leslie; Partyka, Richard Anthony; and Standridge, Robert Ted, 4,056,540, Cl. 260-340.300.
Bristol Products, Inc.: *See*—
Adams, Gerald E., 4,056,420, Cl. 156-181.000.
Britcher, Susan F.: *See*—
Atkinson, Joseph G.; Belanger, Patrice C.; Rooney, Clarence S.; and Britcher, Susan F., 4,056,536, Cl. 260-326.50B.
British Hovercraft Corporation Ltd.: *See*—
Henry, John, 4,056,645, Cl. 428-65.000.
British Petroleum Company Limited, The: *See*—
Gregory, Reginald; and Kolombos, Alexander John, 4,056,575, Cl. 260-673.500.
Gregory, Reginald; and Kolombos, Alexander John, 4,056,576, Cl. 260-683.300.
British Steel Corporation: *See*—
Townsend, Nicholas A., 4,056,231, Cl. 241-23.000.
Brix, Charles J., to Minnesota Mining and Manufacturing Company. Dental abrading device and method. 4,055,897, Cl. 32-59.000.
Brolin, Stephen Joseph; and Colodner, Samuel, to Bell Telephone Laboratories, Incorporated. Automatic number identification in subscriber loop carrier systems. 4,056,690, Cl. 179-17.00A.
Brolin, Stephen Joseph, to Bell Telephone Laboratories, Incorporated. Telephone ringing detectors. 4,056,694, Cl. 179-84.00R.
Broanikov, Vladimir Konstantinovich: *See*—
Bukrinsky, Anatoly Matveevich; Matskevich, Genrikh Vladimirovich; Rzheznikov, Julian Vulfovich; Sukhov, Andrei Borisovich; Tatarnikov, Viktor Petrovich; Berkovich, Viktor Mozesovich; Remzhin, Jury Nikolaevich; Slepnev, Lev Nikolaevich; Sverdlov, Alexandr Anatolievich; Karan, Vladimir Geselevich; Kaloshin, Jury Petrovich; Krasikov, Anatoly Nikolaevich; Babenko, Evgeny Akimovich; Bronnikov, Vladimir Konstantinovich; Shvyryaev, Jury Vasilievich; and Shiryaev, Boris Semenovich, 4,056,436, Cl. 176-38.000.
Brown, Dwight C. Combination plastic and metal paper clip. 4,055,874, Cl. 24-67.300.
Brown, Edgar D., Jr., to General Electric Company. Hydrocarbonoxy-containing silicone fluids useful as hydraulic fluids. 4,056,546, Cl. 260-448.80R.
Brown, Ernest A. Hard boiled egg extractor. 4,056,051, Cl. 99-516.000.
Brown, Joel E.; and Overman, Kelly C., to Westinghouse Electric Corporation. Digital-to-analog noise generator. 4,056,788, Cl. 331-78.000.
Brown, John B. Absolute relative position encoder processor and display. 4,056,850, Cl. 364-900.000.
Brown, Richard L., to Lo-Rise Elevator Company. Operating mechanism for overlapping panels type doorway closures. 4,056,162, Cl. 187-52.00R.
Brown, Richard N., to General Electric Company. Coffeemaker with brew strength control. 4,056,050, Cl. 99-305.000.
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, to Smith Kline & French Laboratories Limited. Imidazolylmethylthioethyl dithiocarbamate compounds. 4,056,621, Cl. 424-273.00R.
Brown & Williamson Tobacco Corporation: *See*—
Grimm, Wolfgang H., 4,056,047, Cl. 93-49.00M.
Brucciani, Richard Louis, to Paper Lynen Co. Ltd., The. Disposable caps. 4,055,857, Cl. 2-197.000.
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Schuldenfrei, Raymond E., 4,056,376, Cl. 55-497.000.
Brzezinski, Donald E.: *See*—
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Bubar, Stanley F., to General Electric Company. Ceramic lamp having tubular inlead containing yttrium-zirconium mixture. 4,056,752, Cl. 313-217.000.
Buchanan, Ronald Leslie; Partyka, Richard Anthony; and Standridge, Robert Ted, to Bristol-Myers Company. 4-Phenyl-1,3-benzodioxans. 4,056,540, Cl. 260-340.300.
Budliger, Jean-Pierre: *See*—
Arieh, Simon; and Budliger, Jean-Pierre, 4,056,002, Cl. 73-194.00R.
Budrose, Charles R., to Upaya, Inc. Teaching typewriter. 4,055,905, Cl. 35-5.000.
Bukrinsky, Anatoly Matveevich; Matskevich, Genrikh Vladimirovich; Rzheznikov, Julian Vulfovich; Sukhov, Andrei Borisovich; Tatarnikov, Viktor Petrovich; Berkovich, Viktor Mozesovich; Remzhin, Jury Nikolaevich; Slepnev, Lev Nikolaevich; Sverdlov, Alexandr Anatolievich; Karan, Vladimir Geselevich; Kaloshin, Jury Petrovich; Krasikov, Anatoly Nikolaevich; Babenko, Evgeny Akimovich; Bronnikov, Vladimir Konstantinovich; Shvyryaev, Jury Vasilievich; and Shiryaev, Boris Semenovich. System for mitigating the effects of an accident at a nuclear power plant. 4,056,436, Cl. 176-38.000.
Bunce, Roger Abraham: *See*—
Peters, Ann Margaret; Greaves, Geoffrey Stuart; Clark, Ian Robert; Holder, Roger Leonard; and Bunce, Roger Abraham, 4,056,361, Cl. 23-259.000.
Bunn, Dorrance P., Jr.; Strickland, John C.; and May, Douglas H., Jr., to Texaco Inc. Fluidized catalytic cracking regeneration process. 4,056,486, Cl. 252-417.000.
Burdeska, Kurt: *See*—
Schwander, Hansrudolf; Burdeska, Kurt; and Zickendraht, Christian, 4,056,528, Cl. 260-250.00Q.
Burdis, Eric William: *See*—
Whitfield, John Alan; and Burdis, Eric William, 4,056,804, Cl. 340-146.30J.
Burgess, F. Travers: *See*—
Boyce, Leonard D., 4,056,087, Cl. 123-127.000.
Burgyan, Lajos, to Zenith Radio Corporation. Signal distributing and muting system for multiple channel FM stereo system. 4,056,685, Cl. 179-15.0BT.
Burke, Jerry Allen, Jr.: *See*—
Davoud, John Gordon; and Burke, Jerry Allen, Jr., 4,055,951, Cl. 60-514.000.
Burkett, Richard O., to Westinghouse Air Brake Company. Remote control brake system for a railway train. 4,056,286, Cl. 303-20.000.
Buro Patent AG: *See*—
Ritter, Bruno, 4,056,063, Cl. 104-88.000.
Burroughs Corporation: *See*—
Beery, Jack, 4,056,183, Cl. 197-1.00R.
Paige, Walter Griffin, 4,056,299, Cl. 339-95.00D.
Smith, Douglas A., 4,056,830, Cl. 360-51.000.
Burroughs Wellcome Co.: *See*—
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, 4,056,632, Cl. 424-330.000.
Burtis, Wilson A. Counterrotation electric motor. 4,056,746, Cl. 310-115.000.
Bussiere, Lawrence S. Spinning machine. 4,055,939, Cl. 57-62.000.
Byrd, Carlisle O., Jr., to Johns-Manville Corporation. Refractory fiber blanket module. 4,055,926, Cl. 52-475.000.
Byrnes, Leo A., to Acme Mills Company. Disposable back seat headrest cover. 4,056,281, Cl. 297-220.000.
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LeBoutet, Hubert, 4,056,728, Cl. 250-396.00R.
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Stewart, Thomas L.; and Cadena, Edward R., 4,055,986, Cl. 73-61.00R.
Cahn, Robert P.: *See*—
Li, Norman N.; and Cahn, Robert P., 4,056,462, Cl. 208-308.000.
Caisley, Jack Banks. Jacking assembly. 4,056,256, Cl. 254-106.000.
Calegan, Everett L., to Junkunc Bros. American Lock Company. Combination-controlled and key-operated security padlock. 4,055,972, Cl. 70-21.000.
Calgon Corporation: *See*—
Slagel, Robert Clayton; and Sinkovitz, Gloria DiMarco, 4,056,432, Cl. 162-168.0NA.
Callahan, Robert William; Kauffman, Paul Eugene; Kobesky, Lawrence Joseph; and Page, Howard Loomis, to International Business Machines Corporation. Data processing system with apparatus for sharing channel background processing. 4,056,846, Cl. 364-200.000.
Calmon, Calvin. Containment and removal of radioactive spills by depositing a crosslinked ion exchange composition in a dry form over region of spill. 4,056,112, Cl. 134-6.000.
Campagnolo, Tullio. Disk brake. 4,056,172, Cl. 188-26.000.
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Tomczak, Lawrence William; Crall, Frederick William; Caron, La Verne Andrew; and Campau, Walter Joseph, 4,055,886, Cl. 29-593.000.
Campbell, Barrie C., to Billings Energy Research Corporation. Electrolysis apparatus. 4,056,452, Cl. 204-258.000.
Cantera, Gregorio Asua; Reparaz, Jose M. Palacios; and Molnar, Louis, to Inland Steel Company; and S.A. Echevarria. Leaded steel bar free of lead macroinclusions. 4,056,387, Cl. 75-123.00F.
Capelli, Alfred J., to Sargent Industries, Inc. Bearing material employing frangible microcapsules containing lubricant. 4,056,478, Cl. 252-12.400.
Cappuyns, Joseph Marie: *See*—
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Carl Freudenberg, Firma: *See*—
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Carlier, Jacques; and Risbourg, Bernard, to Commissariat a l'Energie Atomique. Loading and unloading of a nuclear reactor core. 4,056,435, Cl. 176-30.000.
Carlson, Christian, Jr.; and Hillyer, Michael J., to General Signal Corporation. Modular motor. 4,056,749, Cl. 310-239.000.
Carlson, Richard D.; and Takahashi, Akio, to Hooker Chemicals & Plastics Corporation. Composition comprising phenolic resins and curing amounts triaza phosphaadamantane compounds. 4,056,512, Cl. 260-59.00R.
Carlson, William L., Jr., to General Signal Corporation. Scotch yoke. 4,056,011, Cl. 74-50.000.

Carmichael, Thomas F., to Syncro Corporation. Ignition system. 4,056,088, Cl. 123-148.00E.

Caron, La Verne Andrew: *See—*
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Carpenter, Anthony P., to Mohawk Video Systems Corporation. Automatic chlorinator. 4,056,470, Cl. 210-94.000.

Carpentier, Alain; Leclercq, Xavier; and Paris, Jean, to Rhone-Poulenc Industries. Support for a natural human heart valve. 4,055,861, Cl. 3-1.500.

Carre, Christian; and Rouault, Claude, to Air-Industrie. Metering device for a powdery material. 4,056,234, Cl. 141-392.000.

Carrier Corporation: *See—*
Cross, Robert L., Jr.; Hill, M. Raymond; and Tucker, Fred, 4,056,748, Cl. 310-168.000.

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Carrow, Guy E., to Phillips Petroleum Company. Method of producing a flexible extrudate of a mixture of poly(phenylene sulfide) and filler. 4,056,594, Cl. 264-176.00R.

Carter, Garry L.; and Granzow, Daniel B., to Baxter Travenol Laboratories, Inc. Valve for interconnecting sterile containers and the like. 4,056,116, Cl. 137-68.00R.

Carter, Robert: *See—*
Roe, Alfred W.; Ogden, John; and Carter, Robert, 4,056,235, Cl. 220-4.00E.

Cartwright, William J., to Continental Group, Inc., The. Conveyor unloader. 4,056,185, Cl. 198-484.000.

Cassel, Thomas R. Coupling for pipe lap joints. 4,056,273, Cl. 285-337.000.

Caswell, Robert L., to Rockwell International Corporation. One shot pulse generator and logic level converter circuit. 4,056,735, Cl. 307-273.000.

Caterpillar Mitsubishi Ltd.: *See—*
Uchiyama, Kanji, 4,056,250, Cl. 248-14.000.

Caterpillar Tractor Co.: *See—*
Downing, Benjamin A., 4,056,295, Cl. 312-107.000.
Kamman, Kenneth R.; and Jacobson, Wayne D., 4,056,044, Cl. 92-159.000.
Ritchie, James A., 4,056,336, Cl. 418-51.000.
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Cavlin, Soren: *See—*
Hansen, Karl Erik; Hovmand, Svend; Pedersen, Mogens Lindskov; Schwartzbach, Christian; Htun, Myat; de Ruvo, Alf; and Cavlin, Soren, 4,055,903, Cl. 34-12.000.

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Ceiling Resurfacing Systems, Inc.: *See—*
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Celanese Canada Limited: *See—*
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Celanese Corporation: *See—*
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Center for the Environment & Man, The: *See—*
Henriques, Frederick C.; Pandolfo, Joseph P.; and Lunde, Peter, 4,056,090, Cl. 126-271.000.
Rosenberg, Paul, 4,056,094, Cl. 126-271.000.

Centera, Benny. Stud lock. 4,056,035, Cl. 85-8.900.

Centro-Maskin Goteborg AG: *See—*
Bralander, Borje; Claesson, Ake; Henningsson, Lars-Erik; and Scheel, Johan, 4,055,918, Cl. 51-47.000.

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Centro Sperimentale Metallurgico S.p.A.: *See—*
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Ceskoslovenska akademie ved: *See—*
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Chalco Engineering Co.: *See—*
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Champion International Corporation: *See—*
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Chance, Davey J.: *See—*
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Chang, Joyce Y.: *See—*
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Charnoe, Zeera Polyandre, to Devatron Limited. Method of and apparatus for treating plant organisms. 4,055,915, Cl. 47-58.000.

Chelin, Charles R., to Towmotor Corporation. Load force bypassing apparatus for lift truck masts. 4,056,170, Cl. 187-95.000.

Chemische Fabrik Uetikon: *See—*
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Chen, Ho Sou; Gyorgy, Ernst Michael; Leamy, Harry John; and Sherwood, Richard Curry. Method of making magnetic devices including amorphous alloys. 4,056,411, Cl. 148-121.000.

Chevron Research Company: *See—*
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Unverferth, Jack W., 4,056,461, Cl. 208-11.00R.

Chiarino, Dario: *See—*
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Chicago Fire Brick Company: *See—*
Rechter, Harold L.; and Haligarda, James R., 4,056,398, Cl. 106-65.000.

Chinoy, Rustam B.: *See—*
Terranova, Carmen S.; and Chinoy, Rustam B., 4,055,967, Cl. 64-28.00R.

Chiu, Fon-Wen: *See—*
Liu, Yu-Hsing; and Chiu, Fon-Wen, 4,055,864, Cl. 4-253.000.

Chow, Ho, to Beatrice Foods Co. Humidifier assembly. 4,056,582, Cl. 261-30.000.

Chow, Sen-te; and Thomas, Earl M., to United States of America, Army. Automatic reticle brightness control circuit means in night vision image intensifiers. 4,056,721, Cl. 250-213.0VT.

Christen, Gilbert; Favre, Bernard; Marze, Xavier; Salmon, Michel; and Thuillier, Rene, to Rhone-Poulenc S.A. Hollow fibres. 4,056,467, Cl. 210-23.00F.

Christenson, Per Tyke: *See—*
Richter, Johan C. F. C.; Christenson, Per Tyke; and Richter, Ole Johan, 4,056,429, Cl. 162-17.000.

Chromalloy American Corporation: *See—*
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Chrysler Corporation: *See—*
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Chung, Jackson, to Reliance Electric Company. Multiple power path concentric speed reducer. 4,056,018, Cl. 74-665.00P.

Churchill, William P., Jr., to Data General Corporation. Memory access technique. 4,056,845, Cl. 364-200.000.

Churla, John J., to Thomas & Betts Corporation. Die set. 4,055,980, Cl. 72-410.000.

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Whitney, James C.; and Ciaraldi, Anthony, 4,056,835, Cl. 360-105.000.

Ciba-Geigy AG: *See—*
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Ciba-Geigy Corporation: *See—*
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Schwander, Hansrudolf; Burdeska, Kurt; and Zickendraht, Christian, 4,056,528, Cl. 260-250.00Q.

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Cincinnati Electronics Corporation: *See—*
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Ciniglio, Alexander J.; and Hadfield, Richard M., to Rotawinder Limited. Apparatus and a method of winding filamentary material. 4,056,238, Cl. 242-25.00R.

Cisney, Merle Edward, to Crown Zellerbach Corporation. 2,6-Dialkyl-4-hydroxysulfenyl chlorides. 4,056,568, Cl. 260-543.00H.

Claesson, Ake: *See—*
Bralander, Borje; Claesson, Ake; Henningsson, Lars-Erik; and Scheel, Johan, 4,055,918, Cl. 51-47.000.

Clark, Ian Robert: *See—*
Peters, Ann Margaret; Greaves, Geoffrey Stuart; Clark, Ian Robert; Holder, Roger Leonard; and Bunce, Roger Abraham, 4,056,361, Cl. 23-259.000.

Clark, Judith Ann, to Beecham Group Limited. Diphenylpropylamines for treating depression. 4,056,630, Cl. 424-330.000.

Clark, Thomas G.: *See—*
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Clary, Kenneth B.: *See—*
Rabelos, Nicholas A., 4,056,166, Cl. 182-5.000.

Clayton, James William Barnes, to Platt Saco Lowell Limited. Open-end spinning. 4,055,938, Cl. 57-58.890.

Clifford, Cecil Frank; and Finlayson, Laurence Harry, to Horstmann Clifford Magnetics Ltd. Oscillating reed electric motors. 4,056,743, Cl. 310-21.000.

Clinton, Henry H.; and Zeichner, David A., to Clinton Instrument Company. Remotely controlled high potential insulation tester. 4,056,771, Cl. 324-54.000.

Clinton Instrument Company: *See—*
Clinton, Henry H.; and Zeichner, David A., 4,056,771, Cl. 324-54.000.

Close, Ralph E.; and Derfer, John M., to SCM Corporation. Synthesis of acyclic, terpene alcohols. 4,056,573, Cl. 260-631.500.

Cobb, Clyde A., to Ziamatic Corporation. Oxygen bottle carrier and linkage. 4,056,017, Cl. 74-522.000.

Cobb, Raymond L., to Phillips Petroleum Company. Pyrolysis of N-substituted-1-cyclohexene-1,2-dicarboximides. 4,056,542, Cl. 260-346.300.

Cochran, Veronica: *See—*
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Coherent Radiation: *See—*
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Cohn, Marvin, to Westinghouse Electric Corporation. Suppression of parametric oscillations in IMPATT amplifiers and oscillators. 4,056,784, Cl. 330-287.000.

Coles, Donald K. Musical apparatus. 4,056,032, Cl. 84-1.010.
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Coller, John, to Elixir Industries. Door and threshhold assembly. 4,055,917, Cl. 49-469.000.
Colletta, Angelo; and Palumbo, Luigi, to Centro Sperimentale Metallurgico S.p.A. Coke production. 4,056,443, Cl. 201-5.000.
Collica, Carl; Epifano, Leonard; and Farella, Ralph, to Medi-Ray, Inc. Shielded syringe. 4,056,096, Cl. 128-1.100.
Collica, Carl; Epifano, Leonard; and Farella, Ralph, to Medi-Ray, Inc. Apparatus for housing radiation measuring material housed in a plastic insert. 4,056,729, Cl. 250-472.000.
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Debrie, Guy; Grenier, Claude; Petit, Michel; Rigaut, Henri; and Vertut, Jean, 4,056,763, Cl. 318-675.000.
Gama, Jean-Michel; Lallement, Jean; and Pugnet, Lucien, 4,056,438, Cl. 176-50.000.
Giacometti, Christian; Mougniot, Jean-Claude; and Ravier, Jean, 4,056,437, Cl. 176-40.000.
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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximillian, to Warner-Lambert Company. Alpha-aryl-2-pyridineethanol 1-oxides and alpha-pyridinyl-2-pyridineethanol 1-oxides. 4,056,532, Cl. 260-296.00R.
Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 1-Substituted-2-(2-pyridinyl)ethanone N-oxides. 4,056,619, Cl. 424-263.000.
Connor, Shirley A.: *See—*
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Connor, Thomas R.; and Connor, Shirley A. Apparatus for motorcycle polo game. 4,056,268, Cl. 273-118.00R.
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Continental Oil Company: *See—*
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Cook, Charles R., Jr.; U, Aung San; and Scherrer, Raymond E., to International Telephone and Telegraph Corporation. Method for providing electrical isolating material in selected regions of a semiconductive material. 4,056,415, Cl. 148-187.000.
Cook, Charles R., Jr., to International Telephone and Telegraph Corporation. Self-aligning package for integrated circuits. 4,056,681, Cl. 174-52.0FP.
Cooper, Earl A.; and Howett, Michael J., to Automation Industries, Inc. Electrical connector with coupling assembly breech retaining means. 4,056,298, Cl. 339-90.00R.
Cooper, Earl D., to Phillips Petroleum Company. Process and die for extrusion of a resinous material. 4,056,597, Cl. 264-169.000.
Cope, James R. Tension tester for tennis racket strings. 4,055,999, Cl. 73-145.000.
Corbett, Andrew Neville. Occlusal programming unit. 4,055,896, Cl. 32-19.000.
Corneal Sciences, Inc.: *See—*
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,056,496, Cl. 260-29.6TA.
Cornelissens, Emery George Philomena: *See—*
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Corradi, Ariello Rolando; and Fagherazzi, Giuliano, to Montedison, S.p.A. Process for preparing acicular iron powders containing titanium and tin, and the resulting powders when so prepared. 4,056,410, Cl. 148-105.000.
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Coviello, Joseph. Hand-grippable driver-fastener tool. 4,056,020, Cl. 81-177.00A.
Cox, John Michael: *See—*
Bowie, Raymond Alexander; Cox, John Michael; Farrell, Gordon Michael; and Shephard, Margaret Claire, 4,056,384, Cl. 71-92.000.
Crall, Frederick William: *See—*
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Cramer, Robert J.; and Raymond, Maurice A., to Olin Corporation. Solvent composition used to clean polyurethane foam generating equipment. 4,056,403, Cl. 134-22.00R.
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Crawford Industries, Inc.: *See—*
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Crawford, Kenneth Z., to Crawford Industries, Inc. Loose leaf binder. 4,056,326, Cl. 402-30.000.
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Crosby, Lawton H.; and Keane, Thomas H., to Morley Furniture Spring Corporation. Spring attachment assemblies. 4,055,865, Cl. 5-259.00R.
Cross, Donald James. Mineral jigs. 4,056,464, Cl. 209-425.000.
Cross, Robert L., Jr.; Hill, M. Raymond; and Tucker, Fred, to Carrier Corporation. Magnetic speed pickup. 4,056,748, Cl. 310-168.000.
Crown Zellerbach Corporation: *See—*
Cisney, Merle Edward, 4,056,568, Cl. 260-543.00H.
Cure, Omer P., to Electro-Nite Co. Thermocouple. 4,056,407, Cl. 136-232.000.
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Dahlberg, Alf-Goran; Hogberg, Karl Gustav; Lindvall, Sven; and Rydh, Thore Oskar Verner, to Astra Lakemedel Aktiebolag. Polymer prepared by cyanhydrin method. 4,056,672, Cl. 536-1.000.
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Izumi, Ryoji; Kobayashi, Shoji; Ono, Toshiharu; Shirato, Toru; Fujii, Akiyoshi; and Okihara, Tadashi, 4,056,592, Cl. 264-141.000.
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Forster, Hans-Joachim M.; and Gaus, Hermann, 4,056,176, Cl. 192-4.00A.
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Boserup, Hans C., 4,056,198, Cl. 214-1.0BC.
Darrah, Robert M. Recovery of gold and silver from mine-run dumps or crushed ores using a portable ion-exchange carbon plant. 4,056,261, Cl. 266-101.000.
Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe electronic polarized relay. 4,056,739, Cl. 307-360.000.
Dashew, Stanley A.; and Sutton, Charles D., to Omnithruster Inc. Boat thruster. 4,056,073, Cl. 114-151.000.
Data Flo Corporation: *See—*
Hoerning, John S.; Halverson, Richard P.; and Nelson, Darrell E., 4,056,809, Cl. 364-200.000.
Data General Corporation: *See—*
Churchill, William P., Jr., 4,056,845, Cl. 364-200.000.
Godbout, Joseph C.; and Feldstein, Michael A., 4,056,831, Cl. 360-77.000.
Saxena, Arjun N.; and Hart, Courtney, 4,056,642, Cl. 427-84.000.
Dates, Harold F.; Domicone, Joseph J.; and Nitsche, Joseph E., to Corning Glass Works. Process for making aluminum-coated glass-ceramic cooking vessel and article produced thereby. 4,056,650, Cl. 428-332.000.
Daus, John J., Jr.; James, Henry E.; and Reinhart, Thomas L., to Anchor Industries, Inc. Corner connector. 4,056,327, Cl. 403-172.000.
David, Melvin J. Environmental platelet agitator. 4,056,260, Cl. 366-144.000.
Davis, Donald E.; Habegger, Millard A.; and Yourke, Hannon S., to International Business Machines Corporation. Apparatus for detecting registration marks on a target such as a semiconductor wafer. 4,056,730, Cl. 250-492.00R.
Davoud, John Gordon; and Burke, Jerry Allen, Jr., to D-Cycle Associates. Condensing vapor heat engine with two-phase compression and constant volume superheating. 4,055,951, Cl. 60-514.000.
Dawson, Chester W.: *See—*
McHugh, James P.; Nalepa, Philip J.; Miller, Robert C.; and Dawson, Chester W., 4,056,378, Cl. 65-18.000.
Day, Leon E., to Watts, George G.; and Pratt, Jeff D. Easy empty seed hopper. 4,056,214, Cl. 222-608.000.
Dayton, Arnold J. Weighing device. 4,056,156, Cl. 177-209.000.
De La Rue Giori S.A.: *See—*
Giori, Gualtiero, 4,056,056, Cl. 101-152.000.

De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See—*
Hetebrij, Albert; and Kloeck, Cornelis Adrianus Geertrudis, 4,056,781, Cl. 325-55.000.

Dean, Floyd E. Axle alignment machine. 4,055,899, Cl. 33-193.000.

de Boer, Jacob; and Walraven, Anthonie, to U.S. Philips Corporation. Servo system for controlling the position of a reading head. 4,056,832, Cl. 360-77.000.

DeBough, Bjorn N. Asphalt emulsion and manufacture thereof. 4,056,401, Cl. 106-277.000.

Debrie, Guy; Grenier, Claude; Petit, Michel; Rigaut, Henri; and Vertut, Jean, to Commissariat a l'Energie Atomique. Device for controlling a mechanical element with effort return. 4,056,763, Cl. 318-675.000.

DEC International, Inc.: *See—*
Schluckbier, Gary W., 4,056,077, Cl. 119-14.080.

de Carteret, Arnold Edward Francis. Reglets and associated components. 4,055,921, Cl. 52-61.000.

Decobert, Jacques L. E., to Alcan Research and Development Limited. Method of crushing particles of material in a ball mill. 4,056,230, Cl. 241-15.000.

Decrane, Charles E., to Olinkraft, Inc. Bag filling apparatus with air contaminate prevention. 4,056,132, Cl. 141-285.000.

Deeks, Ronald George, to Procor Limited. Bottom outlet safety closure. 4,056,117, Cl. 137-68.00R.

Deere & Company: *See—*
Honnold, Darrel Lee, 4,056,149, Cl. 172-311.000.

DeFazio, Charles A.: *See—*
Powanda, Thomas M.; Patella, Ralph F.; Vona, Joseph A.; and DeFazio, Charles A., 4,056,503, Cl. 260-29.60T.

Degen, Bruce D.: *See—*
Fox, Joseph M., III; Degen, Bruce D.; and Leibson, Irving, 4,056,599, Cl. 423-178.000.

Delbouille, Andre: *See—*
Berger, Eugene; Gerard, Pol; Delbouille, Andre; and Deroitte, Jean-Louis, 4,056,668, Cl. 526-124.000.

Della-Bella, Davide; and Chiarino, Dario, to Whitefin Holding S.A. Dimercaptoethyl ether sulfonium compounds and use as antiinflammatory and antirheumatic agents. 4,056,634, Cl. 424-335.000.

Delvaux, Pierre: *See—*
Faille, Marc Della; Delvaux, Pierre; Godard, Pierre; and Mercier, Jean Pierre, 4,056,655, Cl. 428-443.000.

Del Vecchio, Joseph. Food dicer. 4,055,892, Cl. 30-303.000.

Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., to Ayerst McKenna and Harrison Ltd. Process for making pyrano- and thiopyranoindole derivatives. 4,056,537, Cl. 260-326.50B.

Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., to Ayerst, McKenna & Harrison Limited. Process for preparing pyrano- and thiopyranoindole derivatives. 4,056,538, Cl. 260-326.50B.

de Navas Albareda, Jose Luis, to Repla International S.A.H. Method of making a fastener. 4,056,593, Cl. 264-145.000.

Denbyware Limited: *See—*
Richardson, Anthony George, 4,056,648, Cl. 428-138.000.

de Nora, Vittorio; Nidola, Antonio; and Bianchi, Giuseppe, to Diamond Shamrock Technologies S.A. Electrowinning method. 4,056,449, Cl. 204-106.000.

De Nora, Vittorio: *See—*
Giuffre, Luigi; De Nora, Vittorio; and Spaziante, Placido, 4,056,447, Cl. 204-98.000.

Depoitier, Jacques: *See—*
Parisis, Jean; Rossion, Roger; and Depoitier, Jacques, 4,056,349, Cl. 432-36.000.

Derby, Palmer P., to Raytheon Company. Anode assembly for electron discharge devices. 4,056,756, Cl. 315-39.690.

Derfer, John M.: *See—*
Close, Ralph E.; and Derfer, John M., 4,056,573, Cl. 260-631.500.

Deroitte, Jean-Louis: *See—*
Berger, Eugene; Gerard, Pol; Delbouille, Andre; and Deroitte, Jean-Louis, 4,056,668, Cl. 526-124.000.

de Ruvo, Alf: *See—*
Hansen, Karl Erik; Hovmand, Svend; Pedersen, Mogens Lindskov; Schwartzbach, Christian; Htun, Myat; de Ruvo, Alf; and Cavlin, Soren, 4,055,903, Cl. 34-12.000.

Deters, Elmer M., to Weil-McLain Company, Inc. Fluid flow control apparatus and a gasoline dispensing and vapor recovery system utilizing said apparatus. 4,056,133, Cl. 141-301.000.

Detty, Rodney H., to Eaton Corporation. Magnetically actuated viscous fluid coupling. 4,056,178, Cl. 192-58.00B.

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See—*
Bertram, Heidrun; Fahnestich, Rudolf; and Hesse, Joachim, 4,056,658, Cl. 426-2.000.

Devatron Limited: *See—*
Charnoe, Zeera Polyandre, 4,055,915, Cl. 47-58.000.

Devine, Patrick J., to United States of America, Army. Armor plate penetrator. 4,056,060, Cl. 102-52.000.

Dhooge, Alfons Leon; and Cappuyns, Joseph Marie, to AGFA-GEVAERT N.V. Stack forming device. 4,056,264, Cl. 271-177.000.

Diamantoglou, Michael; Magerlein, Helmut; Zielke, Rainer; and Cornelissens, Emery George Philomena, to Diamantoglou, Michael; Magerlein, Helmut; and Zielke, Rainer. Oxidation products of cellulose, hemicellulose and lignin. 4,056,400, Cl. 106-162.000.

Diamond Shamrock Corporation: *See—*
Babinsky, Andrew D.; and Dotson, Ronald L., 4,056,448, Cl. 204-98.000.
Pohto, Gerald R.; Kubrin, Michael J.; and Sutter, Robert C., 4,056,458, Cl. 204-263.000.
Rowe, Edward A., Jr.; and Cawley, William H., 4,056,409, Cl. 148-6.15R.

Diamond Shamrock Technologies S.A.: *See—*
de Nora, Vittorio; Nidola, Antonio; and Bianchi, Giuseppe, 4,056,449, Cl. 204-106.000.

Dickey-john Corporation: *See—*
Bachman, Wesley J., 4,056,817, Cl. 340-253.00Y.

Dictaphone Corporation: *See—*
Ray, Earnest Joseph, 4,056,722, Cl. 250-231.0SE.
Whitney, James C.; and Ciaraldi, Anthony, 4,056,835, Cl. 360-105.000.

Diemer, R. Bertrum, Jr.; and Dunson, James B., Jr. Method for separating immiscible fluids of different density. 4,056,371, Cl. 55-90.000.

Digital Equipment Corporation: *See—*
Quinn, Robert J., 4,056,713, Cl. 364-521.000.

Dinkelacker, Walter; Blum, Rudolf; Abele, Klaus; Knodler, Jurgen; and Ebinger, Peter, to Robert Bosch GmbH. Automotive vehicle performance test stand system and performance measuring method. 4,055,996, Cl. 73-117.000.

Dionne, Norman J.; and Wettstein, Ernest C., to Raytheon Company. Magnetic field aligning means. 4,056,800, Cl. 335-296.000.

Dirham, Walter M., to Bachrach, Osher M. Child's toy halo. 4,055,856, Cl. 2-192.000.

Dissauer, Gerald A.: *See—*
Trenkamp, Robert H.; and Dissauer, Gerald A., 4,056,712, Cl. 235-440.000.

Dix, Walter James. Packaging articles and identifying templates. 4,056,190, Cl. 206-349.000.

Dixon, Jimmie D.; and McCannon, Ralph C. Lightweight pad for semi-rigidly supporting electrical transformers. 4,056,251, Cl. 248-19.000.

Dmitrovsky, Morris; and Kokke, Antoine H., to Amstar Corporation. Two stage continuous crystallization apparatus with controls. 4,056,364, Cl. 23-273.00R.

Dobrovolskaya, Irma Viktorovna: *See—*
Skvortsov, Gennady Alexeevich; Nizeeva, Nellya Nikitichna; Podzharsky, Avrum Iosifovich; and Dobrovolskaya, Irma Viktorovna, 4,056,600, Cl. 423-239.000.

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Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,056,537, Cl. 260-326.50B.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,056,538, Cl. 260-326.50B.

Doherty, Norman R.; and Doherty, Richard F. Electrically actuated power press. 4,056,029, Cl. 83-575.000.

Doherty, Richard F.: *See—*
Doherty, Norman R.; and Doherty, Richard F., 4,056,029, Cl. 83-575.000.

Doi, Kunio; Koike, Kozo; and Sasaki, Toshiro, to Toyo Kogyo Co., Ltd. Rotary piston type internal combustion engines. 4,056,339, Cl. 418-178.000.

Dolgy, Igor Evgenievich: *See—*
Boyadzhian, Varazdat Karapetovich; Khachatrian, Saribek Saakovich; Stepanian, Genrikh Gevorkovich; Eritsian, Volodya Karapetovich; Agavelian, Edik Stepanovich; Nefedov, Oleg Matveevich; Dolgy, Igor Evgenievich; Sisin, Mikhail Fedorovich; Kolbasin, Alexei Yakovlevich; and Anikeev, Ivan Konstantinovich, 4,056,563, Cl. 560-245.000.

Dom Holdings Limited: *See—*
McIntyre, Douglas Owen, 4,056,037, Cl. 85-74.000.

Domer, Josef: *See—*
Pospischil, Reginhard; and Domer, Josef, 4,056,790, Cl. 333-5.000.

Domicone, Joseph J.: *See—*
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Donev, Ivan Yordanov: *See—*
Kamburov, Hristo Kirilov; Vankov, Ivan Danailov; and Donev, Ivan Yordanov, 4,056,725, Cl. 250-336.000.

Dorsch, Robert Eugene, to Uniroyal, Inc. Air deflector for tractor-trailer vehicle. 4,056,279, Cl. 296-1.00S.

Dotson, Ronald L.: *See—*
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Dow Chemical Company, The: *See—*
Gibbs, Dale S.; Wagener, Earl H.; and Wessling, Ritchie A., 4,056,501, Cl. 260-29.6SQ.
Gross, James R., 4,056,502, Cl. 260-29.60N.
Huang, Charles Y.; and Roy, Alejo V., 4,056,442, Cl. 195-62.000.
Symm, Richard H.; and Sheffield, Byford D., 4,056,510, Cl. 260-47.0EP.

Downing, Benjamin A., to Caterpillar Tractor Co. Multiple container and rack system. 4,056,295, Cl. 312-107.000.

Dresser Industries, Inc.: *See—*
Fiegl, David Elmer; Hawthorne, Vaughn Terrey; and Martin, Albert Edward, 4,056,065, Cl. 105-199.00C.
Jett, Marion Barney; and Spriggs, Dennis Mitchel, 4,056,145, Cl. 166-212.000.
Miglierini, Raul A., 4,056,153, Cl. 175-376.000.
Roesner, Raymond Earl, 4,056,004, Cl. 73-151.000.

Dubyaga, Sergei Viktorovich: *See—*
Vulikh, Alexandr Ilich; Zagorskaya, Maina Konstantinovna; Kofman, Izrail Zalmanovich; Pavlovich, Inna Vasilievna; Levitan,

Boris Veniaminovich; Troyan, Nikolai Vasilievich; and Dubyaga, Sergei Viktorovich, 4,056,605, Cl. 423-484.000.
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Dunlop Limited: *See—*
Moring, Peter Lothar Ernst, 4,056,016, Cl. 74-231.00J.
Dunson, James B., Jr.: *See—*
Diemer, R. Bertrum, Jr.; and Dunson, James B., Jr., 4,056,371, Cl. 55-90.000.
Du Pont de Nemours, E. I., and Company: *See—*
Gallini, John Battista; Hauxwell, Gerald Dean; and Whitfield, Christopher Roger, 4,056,240, Cl. 242-47.090.
Gauntt, Sibbley Paul, 4,056,652, Cl. 428-400.000.
Gebhard, John Charles, Jr.; Waggoner, Marion Glen; and Webster, James Lang, 4,056,653, Cl. 428-402.000.
Huang, Hua-Feng; and Yates, Richard Alan, 4,056,638, Cl. 426-244.000.
Rivers, Joseph Tracy, Jr.; and Zaharko, Joe Dennis, 4,055,941, Cl. 57-149.000.
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Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,056,621, Cl. 424-273.00R.
Dutton, Arthur L., Jr., to J. B. Engineering and Sales Company, Inc. Alignment control apparatus for a turntable used in an ultrasonic testing system. 4,055,988, Cl. 73-620.000.
Duval, Lawrence E. Apparatus for bathing persons. 4,055,863, Cl. 4-173.00R.
Dworak, Francis Stanislaus; and Ratti, Renald Anthony, to Bell Telephone Laboratories, Incorporated. Special automatic trunk testing arrangement. 4,056,698, Cl. 179-175.20C.
Dworak, Wilhelm: *See—*
Zorn, Jurgen; Vlemmings, Jan; Muller, Karl-Heinz; Mayer, Siegfried; Dworak, Wilhelm; Hartmann, Eugen; Fader, Martin; Talmon, Wolfgang; Jons, Claus; Sauer, Ivan; and Bosch, Paul, 4,056,337, Cl. 418-131.000.
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Dynamit Nobel Aktiengesellschaft: *See—*
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Detty, Rodney H., 4,056,178, Cl. 192-58.00B.
Eaton Yale Ltd.: *See—*
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Ebinger, Peter: *See—*
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Eckels, Phillip W., to Westinghouse Electric Corporation. Cryogen transfer coupling with adjustable throttle valve for rotating machinery. 4,056,745, Cl. 310-52.000.
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Weinar, Roger Neil; and Eder, John Anthony, 4,055,930, Cl. 52-717.000.
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Eichenhofer, Kurt-Wilhelm; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. Purification of waste water from hydrazine production. 4,056,469, Cl. 210-62.000.
Eiermann, Dankwart, to Wankel GmbH. Rotary piston engine. 4,056,338, Cl. 418-119.000.
Electric Valve Company Limited: *See—*
Bailey, Philip Charles; and Scholz, Hans, 4,056,754, Cl. 313-390.000.
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Huffman, George W., 4,056,676, Cl. 544-29.000.
Soper, Quentin Francis, 4,056,382, Cl. 71-66.000.
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England, J. Melvin: *See—*
Rabelos, Nicholas A., 4,056,166, Cl. 182-5.000.
Enomoto, Keisuke: *See—*
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Esch, Ronald Philip, to International Business Machines Corporation. FET device with reduced gate overlap capacitance of source/drain and method of manufacture. 4,056,825, Cl. 357-23.000.
Essex International, Inc.: *See—*
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Silvis, Richard R.; and Ettinger, John A., 4,056,184, Cl. 198-471.000.
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Evans, Carmi Goodrich. Air cushion vehicle. 4,056,159, Cl. 180-120.000.
Evans, Franklin Temple. Polymorphic support systems. 4,055,866, Cl. 5-367.000.
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Falk, Edward J., to Wagner Electric Corporation. Automotive brake fluid low-level warning sensor. 4,055,957, Cl. 60-535.000.
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Collica, Carl; Epifano, Leonard; and Farella, Ralph, 4,056,729, Cl. 250-472.000.
Farling, Gene M., to Zimmer USA, Inc. Human body implant of graphitic carbon fiber reinforced ultra-high molecular weight polyethylene. 4,055,862, Cl. 3-1.910.
Farnam, Franklin C. Electrical heating device for use with aerosol containers. 4,056,707, Cl. 219-302.000.
Farr, Glyn Phillip Reginald, to Girling Limited. Automatic slack adjuster for vehicle brakes combined with a hydraulic actuator and auxiliary mechanical actuator assembly. 4,056,173, Cl. 188-71.900.
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Farrell, John J., to Farrell Patent Company. Blow molding method with double cycle for core rods. 4,056,590, Cl. 264-89.000.
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Farrell, John J., 4,056,590, Cl. 264-89.000.
Faulkner, Thomas Edward, to Motorola, Inc. Vehicle repeater prioritization system. 4,056,780, Cl. 325-5.000.
Faux, Kenneth R., Sr.; and Wenman, William A., to Phoenix Products Company, Inc. Heavy duty floodlight fixture. 4,056,718, Cl. 362-306.000.
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Fay, Edwin F. Apparatus for pulverizing solid materials. 4,056,233, Cl. 241-39.000.
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Fischer, Hermann: *See—*
Strehler, Hugo; Beer, Ludwig; Heil, Eduard; Urbanek, Friedrich; and Fischer, Hermann, 4,056,514, Cl. 260-75.00R.
Fischer, Paul; and Wisz, Edward, to Chemische Fabrik Uetikon. Adsorption arrangement. 4,056,471, Cl. 210-186.000.
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Fismen, Olav Hakon. Apparatus for cleaning tanks and the like. 4,056,227, Cl. 239-227.000.
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Lingscheit, James N., 4,056,589, Cl. 264-65.000.
Nowroski, Alvin P.; and Root, Lyman V., 4,056,085, Cl. 123-119.00B.
Tsou, Ivan H., 4,056,493, Cl. 260-22.0TN.
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Forster, Hans-Joachim M.; and Gaus, Hermann, to Daimler-Benz Aktiengesellschaft. Drive arrangement for motor vehicles, especially for passenger motor vehicles, with an automatic change-speed transmission. 4,056,176, Cl. 192-4.00A.
Fortune, William S. Vacuum system. 4,056,334, Cl. 417-189.000.
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Fox, Joseph M., III; Degen, Bruce D.; and Leibson, Irving, to Bechtel International Corporation. Process for the recovery of magnesium chloride hydrate and potassium chloride from carnallite and bischofite. 4,056,599, Cl. 423-178.000.
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Franklin, Gerald B.; and Parrish, Clyde F., to United States of America, Army. Radiation polymerized priming compositions. 4,056,416, Cl. 149-19.910.
Franz, Arnold; and Stein, Werner, to Dynamit Nobel Aktiengesellschaft. Flame-resistant laminates. 4,056,656, Cl. 428-460.000.
Fredericks, Walter A., to Rexnord, Inc. Torque transmission coupling. 4,055,966, Cl. 64-13.000.
Freed, Donald L., Jr., to National Mine Service Company. Material gathering device for a mining machine. 4,056,189, Cl. 198-514.000.
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Leisterer, Reinhard; Oelfke, Manfred; Woiczik, Hans; Meyer, Hans-Joachim; and Ostermeier, Rolf, 4,056,801, Cl. 340-2.000.
Friedman, Walter: *See—*
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Fritz, Giselher, to Gewerkschaft Eisenhutte Westfalia. Apparatus for use in mining or tunnelling installations. 4,055,959, Cl. 61-85.000.
Fuji Photo Film Co., Ltd.: *See—*
Horie, Ikutaro; Miyazako, Takushi; Sakaguchi, Shinji; Tsuji, Nobuo; and Kameji, Nagao, 4,056,396, Cl. 96-67.000.
Sato, Masamichi; Kido, Keishiro; and Arai, Noboru, 4,056,395, Cl. 96-36.000.
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Fujinaga, Kyozo: *See—*
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Funcik, Jack F.: *See—*
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Furukawa International U.S.A., Inc.: *See—*
Myers, Albert H., 4,055,931, Cl. 53-22.00B.
Furuta, Eiichiro, to Xerox Corporation. Run length encoding and decoding methods and means. 4,056,828, Cl. 358-133.000.
Furuto, Takashi, to Kabushiki Kaisha Komatsu Seisakusho. Clamping and cutting apparatus. 4,055,869, Cl. 10-25.000.
Furutsutsumi, Yasuzi. Hand-operated apparatus for pneumatically removing dust. 4,055,870, Cl. 15-409.000.
Fusco, Vito A.; Bennett, Joseph C.; Funcik, Jack F.; Kufner, Kenneth L.; and Schneider, Thomas E., to Molex Incorporated. Connector harness assembly machine. 4,055,889, Cl. 29-710.000.
Fussangel, Hubert. Shock absorber. 4,056,040, Cl. 91-25.000.
G. D. Searle & Co.: *See—*
Mueller, Richard A., 4,056,562, Cl. 560-231.000.
Gablin, Kenneth A.; and Hansen, Larry J., to Nuclear Engineering Co., Inc. System for disposing of radioactive waste. 4,056,362, Cl. 23-260.000.
Galasso, Francis S.; Bourdeau, Romeo G.; and Pike, Roscoe A., to United Technologies Corporation. Process for forming filaments from polyamic acid. 4,056,598, Cl. 264-184.000.
Gallini, John Battista; Hauxwell, Gerald Dean; and Whitfield, Christopher Roger, to Du Pont de Nemours, E. I., and Company. Yarn guide. 4,056,240, Cl. 242-47.090.
Gama, Jean-Michel; Lallement, Jean; and Pugnet, Lucien, to Commissariat a l'Energie Atomique. Liquid sodium cooled fast reactor. 4,056,438, Cl. 176-50.000.
Gamus, Abraham; and Knecevic, Zoran, to Unican Security Systems, Ltd. Electric strike. 4,056,277, Cl. 292-341.160.
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Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,056,621, Cl. 424-273.00R.
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Garrick, John R.; and Kendig, Ray C., to Armstrong Cork Company. Powder edge coating for ceiling tile. 4,056,647, Cl. 428-134.000.
Gartung, Clifford W. Removable electrical fixtures for modular wall panels. 4,056,297, Cl. 339-23.000.

Gassman, Paul G., to Ohio State University Research Foundation, The. Ortho-[(alkylthio)(aminocarbonyl)methyl]anilines. 4,056,569, Cl. 260-558.00S.
Gates, Peter Stuart; and Gillon, John, to Fisons Limited. Pesticidal compositions containing benzodioxole derivatives and methods of combating pests. 4,056,625, Cl. 424-282.000.
Gauntt, Sibbley Paul, to Du Pont de Nemours, E. I., and Company. Monofilament of polyhexamethylene adipamide having a surface layer of reduced orientation relative to the orientation of the core. 4,056,652, Cl. 428-400.000.
Gauntt, Wayne M.; and Pye, Earl L. Determination of corrosion rates by an electrochemical method. 4,056,445, Cl. 204-1.00T.
Gaus, Hermann: *See—*
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GEA Luftkuhlergesellschaft Happel GmbH & Co. KG: *See—*
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GEBA, Gesellschaft fuer Brandmeldeanlagen mbH & Co.: *See—*
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Gebhard, John Charles, Jr.; Waggoner, Marion Glen; and Webster, James Lang, to Du Pont de Nemours, E. I., and Company. Spherical-shaped particles from ionomer resins and ethylene/carboxylic acid copolymer resins. 4,056,653, Cl. 428-402.000.
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Geissler, Ulrich C.; and Stith, William J., to Baxter Travenol Laboratories, Inc. Means for reducing tissue thromboplastin in collected blood. 4,056,101, Cl. 128-214.00D.
Gelbman, Alexander: *See—*
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General Atomic Company: *See—*
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General Binding Corporation: *See—*
Staats, Henry N., 4,056,422, Cl. 156-309.000.
General Dynamics Corporation: *See—*
Harbison, Robert Campbell; Bradley, Gerald Arthur; and Lux, Paul Arthur, 4,056,309, Cl. 350-310.000.
Strickland, Frederick W., 4,055,875, Cl. 24-115.00R.
General Electric Company: *See—*
Brown, Edgar D., Jr., 4,056,546, Cl. 260-448.80R.
Brown, Richard N., 4,056,050, Cl. 99-305.000.
Bubar, Stanley F., 4,056,752, Cl. 313-217.000.
Lavallee, Francois A., 4,056,550, Cl. 260-465.00D.
Merrill, Duane F., 4,056,492, Cl. 260-18.00S.
Milkovic, Miran, 4,056,775, Cl. 324-142.000.
Rampel, Guy G.; and Young, Jon R., 4,056,660, Cl. 429-59.000.
Terranova, Carmen S.; and Chinoy, Rustam B., 4,055,967, Cl. 64-28.00R.
General Instrument Corporation: *See—*
Whelan, Robert D., 4,056,795, Cl. 334-15.000.
General Signal Corporation: *See—*
Carlson, Christian, Jr.; and Hillyer, Michael J., 4,056,749, Cl. 310-239.000.
Carlson, William L., Jr., 4,056,011, Cl. 74-50.000.
Gensike, Karl H.; Marsh, Robert C.; and Reinhard, John D., to Dymat Photomatrix Corporation. Microfiche duplicating apparatus. 4,056,321, Cl. 355-99.000.
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Gerdes, Theodor, to Blau KG Fabrik fur Kraftfahrzeugteile. Pressure compensation valve arrangement. 4,056,121, Cl. 137-541.000.
Germerdonk, Rolf; Jonas, Adam; Hullstrung, Dieter; and Scherhag, Bernhard, to Bayer Aktiengesellschaft. Desulfurization of waste gases containing hydrogen sulfide. 4,056,606, Cl. 423-575.000.
Gesellschaft fur Kernforschung m.b.H.: *See—*
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Getchell, Nelson F.: *See—*
Pittman, Allen G.; Wasley, William L.; and Getchell, Nelson F., 4,056,354, Cl. 8-54.000.
Getsch, Edward W., to Pako Corporation. Apparatus for packaging photographic slides in envelopes. 4,055,933, Cl. 53-187.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
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Stoltefuss, Wilhelm; Haller, Herbert; and Hunscher, Ottocar, 4,056,284, Cl. 299-64.000.
Geyken, Erwin: *See—*
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Ghione, Mario: *See—*
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Giacometti, Christian; Mougniot, Jean-Claude; and Ravier, Jean, to Commissariat a l'Energie Atomique. Fast reactor core. 4,056,437, Cl. 176-40.000.
Gibbs, Dale S.; Wagener, Earl H.; and Wessling, Ritchie A., to Dow Chemical Company, The. Cationic structured-particle latexes. 4,056,501, Cl. 260-29.6SQ.
Gibson Electric, Inc.: *See—*
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Gibson, Kenneth A.: *See—*
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Gilkey, Russell; Hilbert, Samuel D.; Sublett, Bobby J.; and Wicker, Thomas H., Jr., to Eastman Kodak Company. Polyester fiber. 4,056,356, Cl. 8-168.00C.
Gilleland, Randall C.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,056,702, Cl. 219-69.00C.
Gilley, George C. Memory utilization system. 4,056,848, Cl. 364-200.000.
Gilliland, George E. Occupant propelled tread vehicle. 4,056,289, Cl. 305-47.000.
Gillon, John: *See—*
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Giori, Gualtiero, to De La Rue Giori S.A. Rotary printing press. 4,056,056, Cl. 101-152.000.
Girard, Edmond, to Society Messier. Heat pump installation. 4,055,965, Cl. 62-324.000.
Girling Limited: *See—*
Farr, Glyn Phillip Reginald, 4,056,173, Cl. 188-71.900.
Newstead, Charles; Assinder, Andrew Charles; and Harvey, Geoffrey, 4,056,175, Cl. 188-196.0BA.
Tickle, Colin John Frederick, 4,056,171, Cl. 188-18.00A.
Wienand, Hans-Jurgen; and Klassen, Horst Willi, 4,056,174, Cl. 188-73.500.
Giros, Marcel A. P. Handling installation for supporting displacing and stacking loads in predetermined positions. 4,056,201, Cl. 214-16.40A.
Giuffre, Luigi; De Nora, Vittorio; and Spaziante, Placido, to Oronzio de Nora Impianti Elettrochimici S.p.A. Electrolyzing alkali metal chlorides using resin bonded asbestos diaphragm. 4,056,447, Cl. 204-98.000.
Glen, John Baird; and James, Roger, to Imperial Chemical Industries Limited. 2,6-Diisopropylphenol as an anaesthetic agent. 4,056,635, Cl. 424-346.000.
Gliniorz, Lothar: *See—*
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Godard, Pierre: *See—*
Faille, Marc Della; Delvaux, Pierre; Godard, Pierre; and Mercier, Jean Pierre, 4,056,655, Cl. 428-443.000.
Godbout, Joseph C.; and Feldstein, Michael A., to Data General Corporation. Thermal compensation for disk pack systems. 4,056,831, Cl. 360-77.000.
Godlewski, Walter A.; Roser, Bernard S.; and Lyons, John B., to Montgomery Ward & Co., Incorporated. Open arm sewing machine cabinet. 4,056,294, Cl. 312-30.000.
Goes, Michael J.; and Masly, John R., to United States of America, Army. Fluidic gap gauge. 4,055,983, Cl. 73-37.500.
Goettler, Lloyd A.; and Lambright, A. James, to Monsanto Company. Process for controlling orientation of discontinuous fiber in a fiber-reinforced product formed by extrusion. 4,056,591, Cl. 264-108.000.
Gohde, Hildegard. Apparatus for counting and/or measuring particles suspended in a fluid medium. 4,056,324, Cl. 356-246.000.
Goi, Mitsuhiro; and Miyashita, Masahiko, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Preparation of succinylsuccinic acid diesters. 4,056,551, Cl. 560-126.000.
Goldsmith, Derek John. Fluid mixing valve for supplying controllable proportions of two inlet fluids from a single outlet. 4,056,124, Cl. 137-625.170.
Gomersall, David W.: *See—*
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Gongwer, Calvin A. Hydraulic thruster. 4,055,947, Cl. 60-221.000.
Gordon, Paul; Ronsen, Bruce; and Kulkarni, Shrikant V., to Strategic Medical Research Corporation. Preparation of ethers of monosaccharides. 4,056,322, Cl. 536-4.000.
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Gotze, Wilhelm: *See—*
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Graf von Berckheim, Constantin. Ion detector. 4,056,772, Cl. 324-72.000.
Gramstrup, Torben W. Adjustable billiard table rail construction. 4,056,266, Cl. 273-9.000.
Granzer, Ernold: *See—*
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Granzow, Daniel B.: *See—*
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Green, Charles R.: *See—*
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Green, Derek, deceased: *See—*
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Greenfield, Kenneth. Demountable boat trailer step. 4,056,270, Cl. 280-166.000.
Greenwald, Richard B., to Polaroid Corporation. Naphthalide indicator dyes. 4,056,539, Cl. 260-326.14R.
Greer, Edward M., to EMG Hydraulics, Inc. Accumulator with open ended shell. 4,056,127, Cl. 138-30.000.
Gregory, Reginald; and Kolombos, Alexander John, to British Petroleum Company Limited, The. Chemical process making aromatic hydrocarbons over gallium catalyst. 4,056,575, Cl. 260-673.500.
Gregory, Reginald; and Kolombos, Alexander John, to British Petroleum Company Limited, The. Chemical process over gallium catalyst converting saturated hydrocarbons to olefins. 4,056,576, Cl. 260-683.300.
Grenci, Carl A. Method and apparatus for removing collars from compressed gas cylinders. 4,055,883, Cl. 29-427.000.
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Griffith, James R.; and O'Rear, Jacques G., to United States of America, Navy. N,N'-bis(3,4-dicyanophenyl) alkanediamides. 4,056,560, Cl. 260-465.00D.
Grimm, Wolfgang H., to Brown & Williamson Tobacco Corporation. Method and apparatus for assembling a package. 4,056,047, Cl. 93-49.00M.
Groby, Chester, to Aktiebolaget Tudor. Apparatus for welding together a cover and a vessel of thermoplastic material. 4,056,425, Cl. 156-499.000.
Grolman, Bernard; and Richards, William, to American Optical Corporation. Device for making opthalmic measurements and method. 4,055,900, Cl. 33-200.000.
Gross, James R., to Dow Chemical Company, The. Absorbent articles made from carboxylic polyelectrolyte solutions containing bis-oxazoline crosslinker and methods for their preparation. 4,056,502, Cl. 260-29.60N.
Grossman, William C. Energy conversion system using windmill. 4,055,950, Cl. 60-398.000.
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Grundmeier, Manfred; Binsack, Rudolf; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Polycarbonate molding compositions. 4,056,504, Cl. 260-37.0PC.
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Latassa, Frank M., 4,056,750, Cl. 313-177.000.
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Gudat, Wolfgang, to WABCO Westinghouse GmbH. Circuit arrangement for producing a digital speed signal corresponding to the angular velocity of a wheel from the half cycle duration of the sinusoidal waveform generated by the wheel. 4,056,287, Cl. 303-91.000.
Guidarini, Dante: *See—*
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Guim, Raul. Light emitting diode blown circuit breaker indicator. 4,056,816, Cl. 340-253.00A.
Gulf Oil Corporation: *See—*
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Gungle, W. Calvin; Koury, Federic; and Keeffe, William M., to GTE Sylvania Incorporated. Metal halide discharge lamp having optimum electrode location. 4,056,751, Cl. 313-217.000.
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Kirchubel, Michael A., 4,056,609, Cl. 424-1.000.
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Gunti, Rolf, to Masyc AG. Set of components for producing variable load-bearing scaffolds. 4,056,180, Cl. 193-35.00J.
Gustafson, Kjell Arne Hakan, to AB Bofors. Threshold circuit. 4,056,738, Cl. 307-359.000.
Gustav Memminger Verfahrenstechnik fur die Maschenindustrie, Firma: *See—*
Fecker, Josef; and Memminger, Gustav, 4,056,239, Cl. 242-47.010.
Gutierrez, Eddie N.: *See—*
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Guzi, John, Jr., to Hercules Incorporated. Dry water-dispersible pigment compositions. 4,056,402, Cl. 106-308.00Q.
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Habegger, Millard A.: *See—*
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Hafeli, Robert, to Von Roll AG. Process for conditioning flue gases in waste material incineration plants with heat utilization. 4,056,068, Cl. 110-8.00A.
Hafke, Carl: *See—*
Baron, Gerhard; Bierbach, Herbert; Hafke, Carl; and Pockrandt, Gunter, 4,056,483, Cl. 252-373.000.
Haggard, Richard A.: *See—*
Lewis, Sheldon N.; and Haggard, Richard A., 4,056,559, Cl. 526-212.000.
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Hahn Manufacturing Co.: *See—*
Hahn, Roy C., 4,056,030, Cl. 83-762.000.
Hahn, Roy C., to Hahn Manufacturing Co. Combined miter box, corner clamp and measuring gauge. 4,056,030, Cl. 83-762.000.
Hakanssons Manufaktur AB: *See—*
Nordh, Rolf Goran, 4,056,282, Cl. 297-389.000.
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Baumann, Hans; Halfmann, Manfred; and Janke, Rudolf, 4,056,142, Cl. 165-133.000.
Haligarda, James R.: *See—*
Rechter, Harold L.; and Haligarda, James R., 4,056,398, Cl. 106-65.000.
Hall, Bobby E., to Halliburton Company. Method for dissolving clay. 4,056,146, Cl. 166-300.000.
Haller, Herbert: *See—*
Stoltefuss, Wilhelm; Haller, Herbert; and Hunscher, Ottocar, 4,056,284, Cl. 299-64.000.
Halliburton Company: *See—*
Hall, Bobby E., 4,056,146, Cl. 166-300.000.
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Hoerning, John S.; Halverson, Richard P.; and Nelson, Darrell E., 4,056,809, Cl. 364-200.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Apparatus for printing and applying pressure sensitive labels. 4,056,424, Cl. 156-384.000.
Hammer, Richard Benjamin: *See—*
Turbak, Albin Frank; and Hammer, Richard Benjamin, 4,056,675, Cl. 536-57.000.
Handa, Susumu: *See—*
Tanaka, Yoshiaki; Handa, Susumu; Nishibata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Saito, Masahiro; Tanimoto, Fumio; and Kitano, Hisao, 4,056,547, Cl. 260-453.00P.
Hannie, David Eugene, to Eastman Kodak Company. Timing layer for color transfer film units comprising copolymer with activation energy to penetration greater than 18 kcal/mole. 4,056,394, Cl. 96-29.00D.
Hansen, Charles D., Jr., to AMF Incorporated. Tobacco/paper sorter method and apparatus. 4,056,463, Cl. 209-111.70R.
Hansen, Karl Erik; Hovmand, Svend; Pedersen, Mogens Lindskov; Schwartzbach, Christian; Htun, Myat; de Ruvo, Alf; and Cavlin, Soren, to Aktieselskabet Niro Atomizer. Method and apparatus for drying disintegrated fiber mass. 4,055,903, Cl. 34-12.000.
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Gablin, Kenneth A.; and Hansen, Larry J., 4,056,362, Cl. 23-260.000.
Hanson, Raymond A. Slipforming method and apparatus for in situ lining of an upwardly open shaft with monolithic concrete. 4,055,958, Cl. 61-41.00R.
Harada, Nobuhiko; Tanaka, Minetaka; Shimano, Masanao; Fujinaga, Kyozo; Nunomura, Kunito; Tamura, Masamitu; Nakamura, Shigeharu; and Akagi, Kazuo, to Kobe Steel, Ltd. Process for etching inner surface of pipe or tube. 4,056,428, Cl. 156-642.000.
Harbison, Robert Campbell; Bradley, Gerald Arthur; and Lux, Paul Arthur, to General Dynamics Corporation. Renewable surface heliostat type solar mirror. 4,056,309, Cl. 350-310.000.
Harchol, Micha, to Princeton Gamma-Tech, Inc. Coaxial gamma ray detector and method therefor. 4,056,726, Cl. 250-370.000.
Hardy, Frederick E.: *See—*
Johnson, Eric M.; Murray, Graeme D.; and Hardy, Frederick E., 4,056,113, Cl. 134-40.000.
Harrison, Stanley Norman, to AudioKinetics Corporation. Linear sound amplifier circuit. 4,056,783, Cl. 330-268.000.
Hart, Cornelis Maria; and Slob, Arie, to U.S. Phillips Corporation. Integrated injection logic memory circuit. 4,056,810, Cl. 365-205.000.
Hart, Courtney: *See—*
Saxena, Arjun N.; and Hart, Courtney, 4,056,642, Cl. 427-84.000.
Harte, Richard A., to International Diagnostic Technology. Fluorometric system, method and test article. 4,056,724, Cl. 250-328.000.
Hartmann, Clinton S.: *See—*
Wagers, Robert S.; and Hartmann, Clinton S., 4,056,793, Cl. 333-72.000.
Hartmann, Eugen: *See—*
Zorn, Jurgen; Vlemmings, Jan; Muller, Karl-Heinz; Mayer, Siegfried; Dworak, Wilhelm; Hartmann, Eugen; Fader, Martin; Talmon, Wolfgang; Jons, Claus; Sauer, Ivan; and Bosch, Paul, 4,056,337, Cl. 418-131.000.

Harvey, Geoffrey: *See*—
Newstead, Charles; Assinder, Andrew Charles; and Harvey, Geoffrey, 4,056,175, Cl. 188-196.0BA.
Harvey, Ronald B.: *See*—
Baert, Victor R.; and Harvey, Ronald B., 4,056,024, Cl. 83-210.000.
Hashimoto, Masaharu, to Kabushiki Kaisha Komatsu Seisakusho. Engine mounting apparatus. 4,056,249, Cl. 248-9.000.
Hashimoto, Masashi: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,056,521, Cl. 260-239.100.
Hasquenoph, Jean H.; and Coutin, Pierre Fernand, to R. Alkan & Cie. Two-purpose hook for aircraft load carriers. 4,056,248, Cl. 244-137.00R.
Haswell, John W. Method and apparatus for making double groove pulleys. 4,055,977, Cl. 72-84.000.
Hauf, Robert Conrad, to Singer Company, The. Automatic one-step buttonholing device. 4,056,070, Cl. 112-158.00B.
Hauser, Manfred; and Schumacher, Werner, to Robert Bosch GmbH. Spool valve arrangement. 4,056,126, Cl. 137-625.650.
Hauxwell, Gerald Dean: *See*—
Gallini, John Battista; Hauxwell, Gerald Dean; and Whitfield, Christopher Roger, 4,056,240, Cl. 242-47.090.
Havens, Charlie C.; and Rutelonis, James A., to Rockwell International Corporation. Gasket apparatus. 4,056,682, Cl. 174-35.0GC.
Hawthorne, Vaughn Terrey: *See*—
Fiegl, David Elmer; Hawthorne, Vaughn Terrey; and Martin, Albert Edward, 4,056,065, Cl. 105-199.00C.
Hayakawa, Mitsuru: *See*—
Watanabe, Yasuaki; Okabe, Yukio; and Hayakawa, Mitsuru, 4,056,826, Cl. 358-19.000.
Hayashi, Torahiko. Apparatus for processing dough. 4,056,346, Cl. 425-373.000.
Hayashi, Tsutomu, to Nafco Giken, Ltd. Electrostatic precipitator. 4,056,372, Cl. 55-152.000.
Haycox, Clarence A.: *See*—
Sienicki, John W.; and Haycox, Clarence A., 4,056,842, Cl. 361-293.000.
Healy, James W. Vapor control in a fuel dispensing nozzle. 4,056,131, Cl. 141-206.000.
Hedstrom, Norman; Wright, David; and O'Toole, Jerome, to Wright Line Inc. Document holder. 4,056,296, Cl. 312-184.000.
Heil, Eduard: *See*—
Strehler, Hugo; Beer, Ludwig; Heil, Eduard; Urbanek, Friedrich; and Fischer, Hermann, 4,056,514, Cl. 260-75.00R.
Heil, Guenter: *See*—
Barzynski, Helmut; Heil, Guenter; Klemm, Karl; and Sander, Helfrid, 4,056,453, Cl. 204-159.230.
Heil, Oskar. Movable diaphragm connector method flexible hinge diaphragm surround and electro-acoustic transducer with folded diaphragm with intermediate flexible portions. 4,056,697, Cl. 179-115.5PV.
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., to Gulf Oil Corporation. Homogeneous polyepoxide-polyanhydride compositions. 4,056,506, Cl. 260-42.180.
Heimburger, Alfons: *See*—
Scholl, Hans-Peter; Heimburger, Alfons; Warkentin, Ulrich; and Saufferer, Manfred, 4,056,709, Cl. 235-30.00R.
Heimburger, Norbert; Sieber, Axel; and Schwinn, Horst, to Behringwerke Aktiengesellschaft. Stable blood plasma, process for preparing it and its use as comparative plasma in coagulation tests. 4,056,484, Cl. 252-408.000.
Heimer, Edgar Philip; and Nussbaum, Alexander Leopold, to Hoffmann-La Roche Inc. Phosphonoacetic acid derivatives of nucleosides. 4,056,673, Cl. 536-27.000.
Hein, George Norton, Jr. Centrifuge rotor for separating phases of a liquid. 4,056,225, Cl. 233-20.00R.
Heinze, Gerhard; Mengel, Manfred; and Reiss, Gerhard, to Bayer Aktiengesellschaft. Zeolite A with improved properties. 4,056,370, Cl. 55-68.000.
Heinzer, Hans; and Muller, Werner, to S I G Schweizerische Industrie-Gesellschaft. Production of bags from a panel of sheet material. 4,056,045, Cl. 93-35.0SB.
Heldor Associates, Inc.: *See*—
Ellington, Harold John; and McNeil, Roy C., 4,055,922, Cl. 52-169.700.
Helger, Roland: *See*—
Breiter, Joachim; and Helger, Roland, 4,056,468, Cl. 210-31.00R.
Hemala, Zdenek: *See*—
Latus, Hans; Hemala, Zdenek; Bleeck, Heinz; and Weber, Rolf Dieter, 4,055,937, Cl. 57-34.00R.
Hemminghaus, Uwe: *See*—
Sander, Hanslothar; Matusch, Siegfried; and Hemminghaus, Uwe, 4,056,475, Cl. 210-402.000.
Henningsson, Lars-Erik: *See*—
Bralander, Borje; Claesson, Ake; Henningsson, Lars-Erik; and Scheel, Johan, 4,055,918, Cl. 51-47.000.
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LaWhite, Eric L.; Henrichon, Ernest G., Jr.; and Bloom, Harvey J., 4,056,263, Cl. 271-3.000.
Henriques, Frederick C.; Pandolfo, Joseph P.; and Lunde, Peter, to Center for the Environment & Man, The. Solar heat collector. 4,056,090, Cl. 126-271.000.
Henry, David W.; and Sturm, Priscilla A., to Stanford Research Institute. N-substituted 3-aminopyrrolidines. 4,056,535, Cl. 260-326.200.
Henry, Edwin Blair, Jr.; Patsey, John A.; Rudolph, Ralph G.; and Schindler, Donald G., to United States Steel Corporation. Weld inspection system with dual flaw detection. 4,055,989, Cl. 73-588.000.
Henry, John, to British Hovercraft Corporation Ltd. Aperture reinforcing means for apertures in reinforced flexible materials. 4,056,645, Cl. 428-65.000.
Henson, Eugene Murl. Character scanned teaching machine. 4,055,907, Cl. 35-9.00R.
Herber, John F., to Monsanto Company. Hydraulic fluids. 4,056,480, Cl. 252-78.500.
Hercules Incorporated: *See*—
Guzi, John, Jr., 4,056,402, Cl. 106-308.00Q.
Hughes, Norman Edward, 4,056,423, Cl. 156-356.000.
Zebree, David T., 4,056,059, Cl. 102-22.00R.
Hermans, Peter, to U.S. Philips Corporation. Method of manufacturing a cathode ray tube. 4,055,877, Cl. 29-25.160.
Hermes, Julius, to Martin Processing, Inc. Closed cycle apparatus for the rapid, continuous and waterless dyeing of textile and plastic materials. 4,055,971, Cl. 68-9.000.
Herrmann, Guenter, to Bayern-Chemie Gesellschaft fur flugchemische Antriebe mit beschrankter Haftung. Reel for winding up safety belts. 4,056,242, Cl. 242-107.40R.
Herrmann, Manfred Franz Reinhold: *See*—
Stoss, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, 4,056,526, Cl. 544-146.000.
Herzog, Helmut: *See*—
Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, 4,056,544, Cl. 260-378.000.
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Bertram, Heidrun; Fahnestich, Rudolf; and Hesse, Joachim, 4,056,658, Cl. 426-2.000.
Hetebrij, Albert; and Kloeck, Cornelis Adrianus Geertrudis, to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Device for calling a ground station by an aircraft. 4,056,781, Cl. 325-55.000.
Hilbert, Samuel D.: *See*—
Gilkey, Russell; Hilbert, Samuel D.; Sublett, Bobby J.; and Wicker, Thomas H., Jr., 4,056,356, Cl. 8-168.00C.
Hill, M. Raymond: *See*—
Cross, Robert L., Jr.; Hill, M. Raymond; and Tucker, Fred, 4,056,748, Cl. 310-168.000.
Hill, William J., to Morgan Construction Company. Coil handling apparatus and system. 4,056,186, Cl. 198-339.000.
Hillyer, Michael J.: *See*—
Carlson, Christian, Jr.; and Hillyer, Michael J., 4,056,749, Cl. 310-239.000.
Hilti Aktiengesellschaft: *See*—
Walser, Karl; Schmid, Kurt; and Scotoni, Ralph, 4,056,062, Cl. 102-86.500.
Hindin, Saul G.; and Pond, George R., to Engelhard Minerals & Chemicals Corporation. High temperature stable catalyst composition and method for its preparation. 4,056,489, Cl. 252-462.000.
Hine, Edward K., Jr., to Hine-Snowbridge, Inc. Bicycle handlebar pack and support therefor. 4,056,219, Cl. 224-36.000.
Hine-Snowbridge, Inc.: *See*—
Hine, Edward K., Jr., 4,056,219, Cl. 224-36.000.
Hinkes, Larry D.: *See*—
Bau, Marcel; Hinkes, Larry D.; and Cosgrave, James, 4,056,278, Cl. 294-19.00R.
Hirota, Toshio: *See*—
Endo, Takuya; and Hirota, Toshio, 4,056,764, Cl. 320-3.000.
Hiroyasu, Mamoru, to Matsushita Electric Industrial Co., Ltd. Magnetic video recorder and cassette providing tape loading. 4,056,834, Cl. 360-85.000.
Hisada, Yoshio: *See*—
Takayama, Chiyozo; Hisada, Yoshio; Kato, Toshiro; and Fujinami, Akira, 4,056,622, Cl. 424-273.00R.
Hitachi, Ltd.: *See*—
Izumi, Chikahiko, 4,056,844, Cl. 364-200.000.
Misono, Masayoshi; Koayama, Masaharu; and Asida, Tutomu, 4,056,306, Cl. 350-160.0LC.
Mitsui, Nobuo; Watanabe, Akinori; Oohira, Takeshi; Kawauchi, Kazuhiko; Nakao, Shoichi; and Teranishi, Katsuya, 4,056,759, Cl. 318-98.000.
Nishikawa, Akio; Yokono, Hitoshi; Numata, Shun-ichi; and Mukai, Junji, 4,056,579, Cl. 260-830.00P.
Saitoh, Takeshi; Akutsu, Eisaku; and Shinagawa, Mitsuhisa, 4,056,787, Cl. 331-59.000.
Suehiro, Akio, 4,056,683, Cl. 179-1.0AT.
Takemoto, Iwao, 4,055,885, Cl. 29-578.000.
Tobise, Masahiro; Kogure, Hiromasa; Kanbara, Tadahiko; and Koseki, Hiroshi, 4,056,767, Cl. 363-141.000.
Yoshimura, Masayoshi, 4,056,413, Cl. 148-175.000.
Hixenbaugh, Dennis L., to American Air Filter Company, Inc. Tubular gas filter. 4,056,374, Cl. 55-377.000.
Hlaban, James J.: *See*—
Kaczmarzyk, Leonard M.; Hlaban, James J.; and McKelvey, Patricia J., 4,056,103, Cl. 128-285.000.
HOBEG Hochtemperaturreaktor-Brennelement G.m.b.H.: *See*—
Huschka, Hans; and Warzawa, Wolfgang, 4,056,641, Cl. 427-6.000.
Hodgson, James H., to Chromalloy American Corporation. Liquid manure spreader. 4,056,226, Cl. 239-172.000.
Hodgson, Robert A., to Maloney-Crawford Tank Corporation. Dual field electric treater. 4,056,451, Cl. 204-305.000.
Hoechst Aktiengesellschaft: *See*—
Albers, Ernst-August; Fester, Walter; and Sassenrath, Bernd, 4,056,516, Cl. 260-79.30M.

Albers, Ernst-August; and Sassenrath, Bernd, 4,056,517, Cl. 260-79.30M.
Bartmann, Wilhelm; Beck, Gerhard; Granzer, Ernold; Musil, Josef; and Teufel, Hermann, 4,056,629, Cl. 424-327.000.
Hunger, Klaus; and Weingarten, Friedrich Wilhelm, 4,056,522, Cl. 260-203.000.
Kleiner, Hans-Jerg, 4,056,571, Cl. 260-583.00E.
Lademann, Rudolf; Landauer, Franz; Lenzmann, Heinrich; Schmiedel, Klaus; and Schwiersch, Wolfram, 4,056,455, Cl. 204-163.00R.
Mischke, Peter, 4,056,523, Cl. 260-205.000.
Reinecke, Rolf; Rauterkus, Karl Josef; Schmieder, Werner; and Lutz, Eleonore, 4,056,497, Cl. 260-29.6TA.
Schiessler, Siegfried; Spietschka, Ernst; and Elinkmann, Hans-Gerd, 4,056,534, Cl. 260-314.500.
Sonnenberg, Helmut; and Kramer, Bruno, 4,056,667, Cl. 526-74.000.
Stenzel, Jurgen, 4,056,388, Cl. 75-129.000.
Weingarten, Friedrich Wilhelm; and Hunger, Klaus, 4,056,553, Cl. 560-43.000.

Hoeger, Ernst; and Baskovic, Franz, to Benckiser-Knapsack GmbH. Process of preventing formation of resinous deposits in the manufacture of paper and the like, and compositions. 4,056,430, Cl. 162-76.000.

Hoerning, John S.; Halverson, Richard P.; and Nelson, Darrell E., to Data Flo Corporation. Fast table lookup apparatus for reading memory. 4,056,809, Cl. 364-200.000.

Hoerz, Richard D.; and Propp, Donald J., to Airco, Inc. Audible signal generating apparatus having selectively controlled audible output. 4,056,741, Cl. 310-322.000.

Hofer, Ernst, to Siemens Aktiengesellschaft. Reversible analog to digital converter. 4,056,820, Cl. 340-347.00C.

Hoffman, Werner; Mueller, Norbert; and von Fraunberg, Karl, to BASF Aktiengesellschaft. Ketolactones. 4,056,541, Cl. 260-343.000.

Hoffmann-La Roche Inc.: *See—*
Heimer, Edgar Philip; and Nussbaum, Alexander Leopold, 4,056,673, Cl. 536-27.000.
Winternitz, Pavol, 4,056,628, Cl. 424-308.000.

Hoffmann, Werner; and Baumann, Manfred, to BASF Aktiengesellschaft. Manufacture of olefinically unsaturated esters. 4,056,545, Cl. 260-410.000.

Hogan, Vaughn C.: *See—*
McCartney, Ronald L.; Arnold, Bruce K.; and Hogan, Vaughn C., 4,056,305, Cl. 350-96.00C.

Hogberg, Karl Gustav: *See—*
Dahlberg, Alf-Goran; Hogberg, Karl Gustav; Lindvall, Sven; and Rydh, Thore Oskar Verner, 4,056,672, Cl. 536-1.000.

Hohmann, Walter; Herzog, Helmut; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Anthraquinone compounds. 4,056,544, Cl. 260-378.000.

Holder, Roger Leonard: *See—*
Peters, Ann Margaret; Greaves, Geoffrey Stuart; Clark, Ian Robert; Holder, Roger Leonard; and Bunce, Roger Abraham, 4,056,361, Cl. 23-259.000.

Holland, David; Milner, David John; and Reed, Hugh Wilma Boulton, to Imperial Chemical Industries Limited. Oxidative coupling process. 4,056,574, Cl. 260-654.00R.

Hollymatic Corporation: *See—*
Wagner, Richard C., 4,055,872, Cl. 17-25.000.

Homanick, George, to PepsiCo Inc. Displaceable ceiling mounted cargo restraint system. 4,056,066, Cl. 105-493.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Okamoto, Kintaro; Kudo, Hirokatu; Ishijimi, Soichi; Kadoiri, Etsuro; Soma, Hiroshi; and Suzuki, Hiroyuki, 4,056,165, Cl. 181-141.000.

Honkanen, Arvid; and Joonase, Paul, to W. R. Grace & Co. Process for expanding. 4,056,587, Cl. 264-53.000.

Honnold, Darrel Lee, to Deere & Company. Rearwardly folding implement. 4,056,149, Cl. 172-311.000.

Hooker Chemicals & Plastics Corporation: *See—*
Carlson, Richard D.; and Takahashi, Akio, 4,056,512, Cl. 260-59.00R.

Horie, Ikutaro; Miyazako, Takushi; Sakaguchi, Shinji; Tsuji, Nobuo; and Kameji, Nagao, to Fuji Photo Film Co., Ltd. Layers used to prevent reticulation in photographic elements. 4,056,396, Cl. 96-67.000.

Horne, John E., to Tousimis Research Corporation. Automatic critical point drying apparatus. 4,055,904, Cl. 34-45.000.

Horstmann Clifford Magnetics Ltd.: *See—*
Clifford, Cecil Frank; and Finlayson, Laurence Harry, 4,056,743, Cl. 310-21.000.

Horstmann, Harald: *See—*
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,056,533, Cl. 548-360.000.

Horwitz, Stuart S.; and Jost, Walter R., to Westinghouse Electric Corporation. Wideband diode switched microwave phase shifter network. 4,056,792, Cl. 333-31.00R.

House Food Industrial Company Limited: *See—*
Sakakibara, Sakuichi; Sugisawa, Ko; and Kitamura, Yukio, 4,056,566, Cl. 426-577.000.

Hovagimyan, Norman; and Link, John Michael, to RCA Corporation. Elastic buffer for serial data. 4,056,851, Cl. 364-900.000.

Hovmand, Svend: *See—*
Hansen, Karl Erik; Hovmand, Svend; Pedersen, Mogens Lindskov; Schwartzbach, Christian; Htun, Myat; de Ruvo, Alf; and Cavlin, Soren, 4,055,903, Cl. 34-12.000.

Howard, Alfred S.; and Selesnick, William. Method of coating annular surfaces. 4,056,644, Cl. 427-284.000.

Howett, Michael J.: *See—*
Cooper, Earl A.; and Howett, Michael J., 4,056,298, Cl. 339-90.00R.

Howland, Rockney W.: *See—*
Morrison, Heber J.; and Howland, Rockney W., 4,056,786, Cl. 330-207.00A.

Howmet Corporation: *See—*
Biebuyck, Lawrence F., 4,055,923, Cl. 52-235.000.

Hsu, Tzu-Hwa: *See—*
White, Richard Manning; and Hsu, Tzu-Hwa, 4,056,803, Cl. 340-15.000.

Htun, Myat: *See—*
Hansen, Karl Erik; Hovmand, Svend; Pedersen, Mogens Lindskov; Schwartzbach, Christian; Htun, Myat; de Ruvo, Alf; and Cavlin, Soren, 4,055,903, Cl. 34-12.000.

Huang, Charles Y.; and Roy, Alejo V., to Dow Chemical Company, The. Lipase composition for glycerol ester determination. 4,056,442, Cl. 195-62.000.

Huang, Hua-Feng; and Yates, Richard Alan, to Du Pont de Nemours, E. I., and Company. Dielectric drying of fungal material and resultant textured product. 4,056,638, Cl. 426-244.000.

Huber, Lothar, to LuK Lamellen und Kupplungsbau GmbH. Clutch disk. 4,056,179, Cl. 192-106.200.

Huffman, George W., to Eli Lilly and Company. Halogenated phenylthioacetamido cephalosporins. 4,056,676, Cl. 544-29.000.

Huge, Gerald W., to Professional Positioners, Inc. Intra-oral tooth positioner and process for production thereof. 4,055,895, Cl. 32-14.00B.

Hughes Aircraft Company: *See—*
Knauer, Wolfgang, 4,056,836, Cl. 361-4.000.

Hughes, Charles C., to R. A. Jones & Co. Inc. Apparatus for folding and gluing carton blanks. 4,056,046, Cl. 93-49.00R.

Hughes, Norman Edward, to Hercules Incorporated. Platemaking apparatus. 4,056,423, Cl. 156-356.000.

Hullstrung, Dieter: *See—*
Germerdonk, Rolf; Jonas, Adam; Hullstrung, Dieter; and Scherhag, Bernhard, 4,056,606, Cl. 423-575.000.

Humber, Leslie G.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,056,537, Cl. 260-326.50B.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,056,538, Cl. 260-326.50B.

Hunger, Klaus; and Weingarten, Friedrich Wilhelm, to Hoechst Aktiengesellschaft. Azo compounds deriving from 3-amino-4-lower carboalkoxy-benzoic acid-4'-phenoxy anilides and 2-hydroxy-3-naphthoic acid-4'-benzoylamino anilides. 4,056,522, Cl. 260-203.000.

Hunger, Klaus: *See—*
Weingarten, Friedrich Wilhelm; and Hunger, Klaus, 4,056,553, Cl. 560-43.000.

Hunscher, Ottocar: *See—*
Stoltefuss, Wilhelm; Haller, Herbert; and Hunscher, Ottocar, 4,056,284, Cl. 299-64.000.

Hunter, Eric; and Green, Derek, deceased (by Green, Muriel Irene, executrix), to United Kingdom Atomic Energy Authority. Forming of materials by extrusion. 4,055,979, Cl. 72-262.000.

Hurt, William S.: *See—*
Bayer, Horst O.; and Hurt, William S., 4,056,581, Cl. 260-972.000.

Huschka, Hans; and Warzawa, Wolfgang, to HOBEG Hochtemperaturreaktor-Brennelement G.m.b.H. Process and apparatus for coating fuel fertile or absorber material containing particles for high temperature fuel elements. 4,056,641, Cl. 427-6.000.

Hutson, Thomas, Jr.; and Makovec, Donald J., to Phillips Petroleum Company. Separation of acid-hydrocarbon emulsions and alkylation process utilizing said separation. 4,056,577, Cl. 260-683.480.

Hydro-Terre Corporation, The: *See—*
Thiac, E. Brandt, 4,056,380, Cl. 71-9.000.

I-T-E Imperial Corporation: *See—*
Brandt, Thomas F.; Netzel, Philip C.; and Wharton, Lennard, 4,056,679, Cl. 174-13.000.
Rys, Tadeusz J., 4,056,797, Cl. 335-6.000.

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Panaritis, Dimitrios P.; and Iacovidis, Spyros A., 4,056,026, Cl. 83-454.000.

IBA Industrial Products Ltd.: *See—*
Taylor, Kenneth John; and Lord, Allan, 4,056,505, Cl. 260-42.180.

ICN Pharmaceuticals, Inc.: *See—*
Robins, Roland K.; Rousseau, Robert J.; and Mian, Abdul M., 4,056,674, Cl. 536-28.000.

Icos Corporation of America: *See—*
Tamaro, George John, 4,055,927, Cl. 52-577.000.
Tamaro, George John, 4,056,154, Cl. 175-416.000.

Ide, Azuma. Machine for indoor running. 4,056,265, Cl. 272-70.000.

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Ieda, Michael; and Friedman, Walter, 4,055,914, Cl. 46-192.000.

Ieda, Michael; and Friedman, Walter, to Ideal Toy Corporation. Sound producing device. 4,055,914, Cl. 46-192.000.

Ife, Robert John: *See—*
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,056,621, Cl. 424-273.00R.

Ii, Akira: *See—*
Shinoda, Kazuo; and Ii, Akira, 4,056,583, Cl. 261-36.00A.

Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; and Takahashi,

Michihisa, to Ricoh Company, Ltd. Developing apparatus for diazo copying machine. 4,056,824, Cl. 354-300.000.
Iizaka, Isao; and Yamamoto, Toshio, to Minolta Camera Kabushiki Kaisha. Process for transferring electrostatic latent images. 4,056,390, Cl. 96-1.0TE.
Ikeda, Masachika, to Olympus Optical Co. Ltd. Device for detachably mounting a manuscript on a rotary cylindrical drum for cylinder scanning type facsimiles. 4,056,829, Cl. 358-256.000.
Ikeda, Sunao: *See*—
Ariyama, Kenzo; Ota, Sakae; Ikeda, Sunao; and Okamoto, Toyoo, 4,056,315, Cl. 355-10.000.
Ikeguchi, Shigehiko; Yamashita, Norio; and Matsuda, Eiji, to Sanyo Electric Co., Ltd.; Tokyo Sanyo Electric Co., Ltd.; and Sanyo Vending Machine Co., Ltd. System and method for determining vendibility in automatic vending machine. 4,056,181, Cl. 194-10.000.
Ikemoto, Masahiko: *See*—
Ito, Kiyoshi; Ikemoto, Masahiko; Kimura, Kazuhiko; and Nakanishi, Teruo, 4,056,626, Cl. 424-285.000.
Imabuchi, Yoshihisa; Kurami, Kenshi; Akiyama, Yoshinori; and Sobajima, Katsunobu, to Nissan Motor Company, Limited. Vehicle occupant restraining belt with device to provide an arrangement in which shoulder belt is prevented from touching seated occupant's neck. 4,056,271, Cl. 280-745.000.
IMI (TAMI) Institute for Research and Development: *See*—
Baniel, Avraham Matitiahu; Mitzmager, Abraham; Segall, Jeanna; Star, Shlomo; and Shorr, Leonard Marshall, 4,056,588, Cl. 264-63.000.
Imperial Chemical Industries Limited: *See*—
Ballard, Denis George Harold; Jones, Eric; Padget, John Christopher; Pioli, Alexander Joseph Peter; Robinson, Peter Anthony; Walker, John; and Wyatt, Ronald John, 4,056,669, Cl. 526-154.000.
Bowie, Raymond Alexander; Cox, John Michael; Farrell, Gordon Michael; and Shephard, Margaret Claire, 4,056,384, Cl. 71-92.000.
Glen, John Baird; and James, Roger, 4,056,635, Cl. 424-346.000.
Holland, David; Milner, David John; and Reed, Hugh Wilma Boulton, 4,056,574, Cl. 260-654.00R.
Staniland, Philip Anthony, 4,056,511, Cl. 260-49.000.
Imperial Metal Industries (Kynoch) Limited: *See*—
Marshall, John Edward, 4,056,069, Cl. 110-7.00R.
Inaba, Kouji: *See*—
Shimizu, Hiroyuki; Inaba, Kouji; and Nakahashi, Ken-Ichi, 4,056,310, Cl. 351-6.000.
Inamoto, Yoshiaki: *See*—
Tanaka, Yoshiaki; Handa, Susumu; Nishibata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Saito, Masahiro; Tanimoto, Fumio; and Kitano, Hisao, 4,056,547, Cl. 260-453.00P.
Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See*—
Jahrig, Gunter, 4,056,236, Cl. 242-18.0DD.
Miller, Harry B.; and Jahrig, Gunter, 4,056,237, Cl. 242-18.0PW.
Ing. C. Olivetti & C., S.p.A.: *See*—
Vittorelli, Vittore, 4,056,821, Cl. 364-900.000.
Inland Steel Company: *See*—
Cantera, Gregorio Asua; Reparaz, Jose M. Palacios; and Molnar, Louis, 4,056,387, Cl. 75-123.00F.
Leckie, Harry P.; Sievert, William C.; and Legault, Robert A., 4,056,657, Cl. 428-659.000.
Lee, Harvie Ho; Gomersall, David W.; and Leckie, Harry P., 4,056,366, Cl. 29-653.000.
Inoue, Michihiro; Kimura, Takeji; Sato, Masaharu; and Tsunoo, Masahiko, to Matsushita Electric Industrial Co., Ltd. Tone generator system for an electronic organ. 4,056,033, Cl. 84-1.240.
Institute za Yadreni Izsledvania I Yadrena Energetika pri Ban: *See*—
Kamburov, Hristo Kirilov; Vankov, Ivan Danailov; and Donev, Ivan Yordanov, 4,056,725, Cl. 250-336.000.
International Business Machines Corporation: *See*—
Baxter, Duane Willard; and Shipway, Richard Edward, 4,056,716, Cl. 364-515.000.
Braun, Roland Joseph; and von Voss, William Ditlef, 4,056,302, Cl. 339-275.00B.
Callahan, Robert William; Kauffman, Paul Eugene; Kobesky, Lawrence Joseph; and Page, Howard Loomis, 4,056,846, Cl. 364-200.000.
Davis, Donald E.; Habegger, Millard A.; and Yourke, Hannon S., 4,056,730, Cl. 250-492.00R.
Esch, Ronald Philip, 4,056,825, Cl. 357-23.000.
Jambotkar, Chakrapani Gajanan, 4,055,884, Cl. 29-571.000.
International Diagnostic Technology: *See*—
Harte, Richard A., 4,056,724, Cl. 250-328.000.
International Nickel Company, Inc., The: *See*—
Shaw, Stuart Walter Ker Sutton, 4,056,389, Cl. 75-171.000.
International Paper Company: *See*—
Green, Charles B.; and Sholter, Joseph R., 4,055,859, Cl. 2-243.00R.
International Spike, Inc.: *See*—
Jackson, Laban P., Jr., 4,055,974, Cl. 71-11.000.
International Standard Electric Corporation: *See*—
Kaiser, Hans; Konnerth, Ernst; and Kramer, Gert, 4,056,343, Cl. 425-112.000.
International Telephone and Telegraph Corporation: *See*—
Cook, Charles R., Jr.; U, Aung San; and Scherrer, Raymond E., 4,056,415, Cl. 148-187.000.
Cook, Charles R., Jr., 4,056,681, Cl. 174-52.0FP.
McCartney, Ronald L.; Arnold, Bruce K.; and Hogan, Vaughn C., 4,056,305, Cl. 350-96.00C.
Place, Harry, 4,056,692, Cl. 179-84.0VF.
Turbak, Albin Frank; and Hammer, Richard Benjamin, 4,056,675, Cl. 536-57.000.
Invo Spline, Inc.: *See*—
Perry, Louis Jamca, 4,056,329, Cl. 408-6.000.
Ionit Anstalt Bernhard Berghaus: *See*—
Luckan, Johannes, 4,056,007, Cl. 73-343.00R.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,055,970, Cl. 68-5.00E.
Ishii, Susumu, to Kabushiki Kaisha Tokyo Keiki. Gyrocompass. 4,055,901, Cl. 33-324.000.
Ishijimi, Soichi: *See*—
Okamoto, Kintaro; Kudo, Hirokatu; Ishijimi, Soichi; Kadoiri, Etsuro; Soma, Hiroshi; and Suzuki, Hiroyuki, 4,056,165, Cl. 181-141.000.
Ito, Kiyoshi; Ikemoto, Masahiko; Kimura, Kazuhiko; and Nakanishi, Teruo, to Kakenyaku Kako Co., Ltd. Pharmaceutical composition containing benzofuran derivative. 4,056,626, Cl. 424-285.000.
Ives, Kenneth D.; Vranka, Ronald S.; and Wagner, George J., Jr., to United States Steel Corporation. Method and mechanism for controlling forces in a continuous-casting machine. 4,056,140, Cl. 164-4.000.
Ivner, Sven, to ASEA Aktiebolag. Static convertor plant. 4,056,768, Cl. 363-79.000.
Izumi, Chikahiko, to Hitachi, Ltd. Memory control system using plural buffer address arrays. 4,056,844, Cl. 364-200.000.
Izumi, Ryoji; Kobayashi, Shoji; Ono, Toshiharu; Shirato, Toru; Fujii, Akiyoshi; and Okihara, Tadashi, to Dai Nippon Toryo Co., Ltd.; and Japan Steel Works Ltd., The. Process for preparation of thermosetting resin powder paints. 4,056,592, Cl. 264-141.000.
J. B. Engineering and Sales Company, Inc.: *See*—
Dutton, Arthur L., Jr., 4,055,988, Cl. 73-620.000.
Jackes, Stanley F.: *See*—
Morrill, Vaughan, Jr.; and Jackes, Stanley F., 4,055,888, Cl. 29-622.000.
Jackson, Laban P., Jr., to International Spike, Inc. Disintegratable fertilizer tablet. 4,055,974, Cl. 71-11.000.
Jacobson, Wayne D.: *See*—
Kamman, Kenneth R.; and Jacobson, Wayne D., 4,056,044, Cl. 92-159.000.
Jacoby, Benjamin Franklin; and Monroe, Marvin E., to Quintron, Inc. Sonic transducer and drive circuit. 4,056,761, Cl. 318-116.000.
Jaffe, Burton. Endotracheal tube. 4,056,104, Cl. 128-351.000.
Jaffe, Sol Samson, to P. R. Mallory & Co. Inc. Electrochemical cell having an AgO electrode discharging at an Ag_2O voltage level. 4,056,664, Cl. 429-217.000.
Jahrig, Gunter, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Machine for winding textile threads. 4,056,236, Cl. 242-18.0DD.
Jahrig, Gunter: *See*—
Miller, Harry B.; and Jahrig, Gunter, 4,056,237, Cl. 242-18.0PW.
Jambotkar, Chakrapani Gajanan, to International Business Machines Corporation. Fabrication of power field effect transistors and the resulting structures. 4,055,884, Cl. 29-571.000.
James, Henry E.: *See*—
Daus, John J., Jr.; James, Henry E.; and Reinhart, Thomas L., 4,056,327, Cl. 403-172.000.
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Glen, John Baird; and James, Roger, 4,056,635, Cl. 424-346.000.
Janin, Pierre R., to American Home Products Corporation. Profile recognition apparatus for identifying bacteria. 4,056,359, Cl. 23-259.000.
Janke, Rudolf: *See*—
Baumann, Hans; Halfmann, Manfred; and Janke, Rudolf, 4,056,142, Cl. 165-133.000.
Japan Natural Food Co. Ltd.: *See*—
Hagiwara, Yoshihide; Tetsuji, Miyauchi; and Morimasa, Yuki, 4,056,637, Cl. 426-52.000.
Japan Steel Works Ltd., The: *See*—
Izumi, Ryoji; Kobayashi, Shoji; Ono, Toshiharu; Shirato, Toru; Fujii, Akiyoshi; and Okihara, Tadashi, 4,056,592, Cl. 264-141.000.
Jardin, Hans; and Auzannet, Jack, to Webasto-Werk W. Baier KG. Vehicle sliding roof construction. 4,056,274, Cl. 296-137.00G.
Jaret, Robert S.: *See*—
Reimann, Hans; Jaret, Robert S.; and Nafissi-Varchei, Mohammad Mehdi, 4,056,616, Cl. 424-180.000.
Jarvis, Harold F., to Shaw Pipe Industries Ltd. Method of fabricating crosslinked thermoplastics articles. 4,056,421, Cl. 156-272.000.
Jarvis, Kenneth W. Door lock. 4,056,276, Cl. 292-201.000.
Jett, Marion Barney; and Spriggs, Dennis Mitchel, to Dresser Industries, Inc. Hydraulic holddown for well packer stinger. 4,056,145, Cl. 166-212.000.
Jirkovsky, Ivo: *See*—
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,056,537, Cl. 260-326.50B.
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,056,538, Cl. 260-326.50B.
Johansson, Lennart Nils; and Svensson, Claes-Goran O., to Forenade Fabrikaverken. Heating device for an external combustion engine. 4,055,952, Cl. 60-517.000.
Johkoh, Katsuhiro: *See*—
Kitaoka, Shigeo; Johkoh, Katsuhiro; Ebisawa, Hisashi; Sato, Tadashi; Kubo, Hiroshi; Takahashi, Sosuke; and Kawase, Yoshinobu, 4,056,631, Cl. 424-330.000.

John C. Bogue: *See*—
Mauch, Robert E.; and Sarbacher, Robert I., 4,056,757, Cl. 315-86.000.

John Wyeth & Brother Limited: *See*—
Black, Robin Michael, 4,056,529, Cl. 260-251.00A.

Johns-Manville Corporation: *See*—
Byrd, Carlisle O., Jr., 4,055,926, Cl. 52-475.000.

Johnson, Alfred Davis. Memory alloy heat engine and method of operation. 4,055,955, Cl. 60-527.000.

Johnson Controls, Inc.: *See*—
Sriramamurty, Durvasula V.; and Brzezinski, Donald E., 4,056,043, Cl. 92-13.200.

Johnson, Eric M.; Murray, Graeme D.; and Hardy, Frederick E., to Procter & Gambie Company, The. Liquid detergent compositions for removal of cooked-on food soils. 4,056,113, Cl. 134-40.000.

Johnson & Johnson: *See*—
Mouwen, Herman Charles; Lauer, William; and Weinberg, Steven Louis, 4,056,476, Cl. 210-446.000.

Johnson, William E.: *See*—
Schmersal, Larry J.; and Johnson, William E., 4,056,806, Cl. 340-166.0EL.

Johnston, Otis A., to Western Geophysical Co. Stabilized portable seismic signal transducer. 4,056,164, Cl. 181-114.000.

Jojima, Teruomi; Tsuji, Hideakira; Yamamoto, Shinjiro; and Omino, Teiji, to Sankyo Company Limited. Organic pyridazyl phosphorothioates and their use as insecticides. 4,056,617, Cl. 424-200.000.

Jolley, William S.; and Cranford, William R. Compass with means for correcting angle of magnetic variation. 4,055,902, Cl. 33-356.000.

Jonas, Adam: *See*—
Germerdonk, Rolf; Jonas, Adam; Hullstrung, Dieter; and Scherhag, Bernhard, 4,056,506, Cl. 423-575.000.

Jonassen, Hans B.: *See*—
McEwan, William S.; and Jonassen, Hans B., 4,056,386, Cl. 75-0.5BA.

Jones, Eric: *See*—
Ballard, Denis George Harold; Jones, Eric; Padget, John Christopher; Pioli, Alexander Joseph Peter; Robinson, Peter Anthony; Walker, John; and Wyatt, Ronald John, 4,056,669, Cl. 526-154.000.

Jones, Genevieve M. Car wash sprayer. 4,056,229, Cl. 239-288.000.

Jones, Nathaniel P. Versatile stretch knit garment. 4,055,854, Cl. 2-105.000.

Jons, Claus: *See*—
Zorn, Jurgen; Vlemmings, Jan; Muller, Karl-Heinz; Mayer, Siegfried; Dworak, Wilhelm; Hartmann, Eugen; Fader, Martin; Talmon, Wolfgang; Jons, Claus; Sauer, Ivan; and Bosch, Paul, 4,056,337, Cl. 418-131.000.

Joonase, Paul: *See*—
Honkanen, Arvid; and Joonase, Paul, 4,056,587, Cl. 264-53.000.

Jordan, Leslie S., to Essex International, Inc. Touch plate assembly. 4,056,699, Cl. 200-5.00A.

Jost, Walter R.: *See*—
Horwitz, Stuart S.; and Jost, Walter R., 4,056,792, Cl. 333-31.00R.

Jumanova, Ljudmila Vladimirovna: *See*—
Volfkovich, Semen Issakovich; Belov, Vladimir Nikolaevich; Ershov, Vadim Andreevich; Rozenberg, Evgeny Khaskelevich; Shipov, Emmanuil Ivanovich; and Jumanova, Ljudmila Vladimirovna, 4,056,601, Cl. 423-322.000.

Junkunc Bros. American Lock Company: *See*—
Calegan, Everett L., 4,055,972, Cl. 70-21.000.

Jurkevich, Igor Rostislavovich: *See*—
Markman, Mikhail Abramovich; Simanovsky, Leonid Mikhailovich; Jurkevich, Igor Rostislavovich; Kolomoets, Nikolai Vasilievich; Kamensky, Vyacheslav Tikhonovich; Matskov, Igor Mikhailovich; and Maximov, Sergei Ilich, 4,056,406, Cl. 136-208.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Furuto, Takashi, 4,055,869, Cl. 10-25.000.
Hashimoto, Masaharu, 4,056,249, Cl. 248-9.000.

Kabushiki Kaisha Sankosha: *See*—
Keikichi, Tsukioka; and Yukio, Takayanagi, 4,056,753, Cl. 313-325.000.

Kabushiki Kaisha Sato: *See*—
Sato, Yo; and Enomoto, Keisuke, 4,056,661, Cl. 428-144.000.

Kabushiki Kaisha Tokyo Keiki: *See*—
Ishii, Susumu, 4,055,901, Cl. 33-324.000.

Kaczmarzyk, Leonard M.; Hlaban, James J.; and McKelvey, Patricia J., to Kimberly-Clark Corporation. Wrapper structure for tampons containing superabsorbent material. 4,056,103, Cl. 128-285.000.

Kadoiri, Etsuro: *See*—
Okamoto, Kintaro; Kudo, Hirokatu; Ishijimi, Soichi; Kadoiri, Etsuro; Soma, Hiroshi; and Suzuki, Hiroyuki, 4,056,165, Cl. 181-141.000.

Kaiser, Hans; Konnerth, Ernst; and Kramer, Gert, to International Standard Electric Corporation. Apparatus for continuously producing raised marks on plastic cable jackets. 4,056,343, Cl. 425-112.000.

Kaiser, Howard E. Hoisting tackle block assembly. 4,056,257, Cl. 254-194.000.

Kakenyaku Kako Co., Ltd.: *See*—
Ito, Kiyoshi; Ikemoto, Masahiko; Kimura, Kazuhiko; and Nakanishi, Teruo, 4,056,626, Cl. 424-285.000.

Kallman Research Corporation: *See*—
Kallman, Robert A., 4,055,873, Cl. 24-3.00C.

Kallman, Robert A., to Kallman Research Corporation. Accessory holder for use on article of clothing. 4,055,873, Cl. 24-3.00C.

Kaloshin, Jury Petrovich: *See*—
Bukrinsky, Anatoly Matveevich; Matskevich, Genrikh Vladimirovich; Rzheznikov, Julian Vulfovich; Sukhov, Andrei Borisovich; Tatarnikov, Viktor Petrovich; Berkovich, Viktor Mozesovich; Remzhin, Jury Nikolaevich; Slepnev, Lev Nikolaevich; Sverdlov, Alexandr Anatolievich; Karan, Vladimir Geselevich; Kaloshin, Jury Petrovich; Krasikov, Anatoly Nikolaevich; Babenko, Evgeny Akimovich; Bronnikov, Vladimir Konstantinovich; Shvyryaev, Jury Vasilievich; and Shiryaev, Boris Semenovich, 4,056,436, Cl. 176-38.000.

Kaman, Charles H. Guitar construction. 4,056,034, Cl. 84-267.000.

Kamann, Gunther; Krahe, Jurgen; Zischinsky, Ulf; and Gotze, Wilhelm, to Bergwerksverband GmbH. Borehole anchor. 4,056,036, Cl. 85-63.000.

Kamburov, Hristo Kirilov; Vankov, Ivan Danailov; and Donev, Ivan Yordanov, to Institute za Yadreni Izsledvania I Yadrena Energetika pri Ban. Method of and system for compensating the distortion of amplitude spectra of multichannel analyzers in spectrometry. 4,056,725, Cl. 250-336.000.

Kameji, Nagao: *See*—
Horie, Ikutaro; Miyazako, Takushi; Sakaguchi, Shinji; Tsuji, Nobuo; and Kameji, Nagao, 4,056,396, Cl. 96-67.000.

Kamensky, Vyacheslav Tikhonovich: *See*—
Markman, Mikhail Abramovich; Simanovsky, Leonid Mikhailovich; Jurkevich, Igor Rostislavovich; Kolomoets, Nikolai Vasilievich; Kamensky, Vyacheslav Tikhonovich; Matskov, Igor Mikhailovich; and Maximov, Sergei Ilich, 4,056,406, Cl. 136-208.000.

Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, to Fujisawa Pharmaceutical Co., Ltd. Penam and cepham derivatives and preparation thereof. 4,056,521, Cl. 260-239.100.

Kamman, Kenneth R.; and Jacobson, Wayne D., to Caterpillar Tractor Co. Oil cooled piston. 4,056,044, Cl. 92-159.000.

Kamyr Aktiebolag: *See*—
Richter, Johan C. F. C.; Christenson, Per Tyke; and Richter, Ole Johan, 4,056,429, Cl. 162-17.000.

Kamzolkin, Vladimir Vasilievich: *See*—
Bashkirov, Andrei Nikolaevich; Grozhan, Mark Markovich; Kamzolkin, Vladimir Vasilievich; Lapitsky, Jury Anatolievich; and Vygodskaya, Irina Vladimirovna, 4,056,572, Cl. 260-624.00R.

Kanbara, Tadahiko: *See*—
Tobise, Masahiro; Kogure, Hiromasa; Kanbara, Tadahiko; and Koseki, Hiroshi, 4,056,767, Cl. 363-141.000.

Kansai Paint Co., Ltd.: *See*—
Kawamura, Masahumi; Takahashi, Wataru; and Watanabe, Tadashi, 4,056,495, Cl. 260-22.0CA.

Kao Soap Co., Ltd.: *See*—
Tanaka, Yoshiaki; Handa, Susumu; Nishibata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Saito, Masahiro; Tanimoto, Fumio; and Kitano, Hisao, 4,056,547, Cl. 260-453.00P.

Kapper, Charles E.: *See*—
Blanchard, James S.; and Kapper, Charles E., 4,056,744, Cl. 310-51.000.

Kapsura, Inc.: *See*—
Bridwell, Willie Earl, 4,055,991, Cl. 73-73.000.

Karan, Vladimir Geselevich: *See*—
Bukrinsky, Anatoly Matveevich; Matskevich, Genrikh Vladimirovich; Rzheznikov, Julian Vulfovich; Sukhov, Andrei Borisovich; Tatarnikov, Viktor Petrovich; Berkovich, Viktor Mozesovich; Remzhin, Jury Nikolaevich; Slepnev, Lev Nikolaevich; Sverdlov, Alexandr Anatolievich; Karan, Vladimir Geselevich; Kaloshin, Jury Petrovich; Krasikov, Anatoly Nikolaevich; Babenko, Evgeny Akimovich; Bronnikov, Vladimir Konstantinovich; Shvyryaev, Jury Vasilievich; and Shiryaev, Boris Semenovich, 4,056,436, Cl. 176-38.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Wilkens, Christian, 4,055,969, Cl. 66-204.000.

Kato, Toshiro: *See*—
Takayama, Chiyozo; Hisada, Yoshio; Kato, Toshiro; and Fujinami, Akira, 4,056,622, Cl. 424-273.00R.

Kauffman, Paul Eugene: *See*—
Callahan, Robert William; Kauffman, Paul Eugene; Kobesky, Lawrence Joseph; and Page, Howard Loomis, 4,056,846, Cl. 364-200.000.

Kawamura, Masahumi; Takahashi, Wataru; and Watanabe, Tadashi, to Kansai Paint Co., Ltd. High solid alkyd resin coating composition curable at ambient temperature. 4,056,495, Cl. 260-22.0CA.

Kawase, Yoshinobu: *See*—
Kitaoka, Shigeo; Johkoh, Katsuhiro; Ebisawa, Hisashi; Sato, Tadashi; Kubo, Hiroshi; Takahashi, Sosuke; and Kawase, Yoshinobu, 4,056,631, Cl. 424-330.000.

Kawata, Shoji, to Aisin Seiki Kabushiki Kaisha. Electronic speed control system for automotive vehicles. 4,056,157, Cl. 180-105.00E.

Kawauchi, Kazuhiko: *See*—
Mitsui, Nobuo; Watanabe, Akinori; Oohira, Takeshi; Kawauchi, Kazuhiko; Nakao, Shoichi; and Teranishi, Katsuya, 4,056,759, Cl. 318-98.000.

Keane, Thomas H.: *See*—
Crosby, Lawton H.; and Keane, Thomas H., 4,055,865, Cl. 5-259.00R.

Keeffe, William M.: *See*—
Gungle, W. Calvin; Koury, Federic; and Keeffe, William M., 4,056,751, Cl. 313-217.000.

Keeler Brass Company: *See*—
Keeler, Miner S., II, 4,056,275, Cl. 292-17.000.

Keeler, Miner S., II, to Keeler Brass Company. Closure catch assembly. 4,056,275, Cl. 292-17.000.

Keikichi, Tsukioka; and Yukio, Takayanagi, to Kabushiki Kaisha Sankosha. Overvoltage protecting element. 4,056,753, Cl. 313-325.000.

Keith, William Johnson, to Metal Products Corporation. Supporting base for rack. 4,056,195, Cl. 211-153.000.

Kelly, Joseph B.; and Gibson, Kenneth A., to PPG Industries, Inc. Forming V bends in glass sheets by press bending. 4,056,379, Cl. 65-106.000.

Kelsey-Hayes Company: *See*—
Rozmus, Walter J., 4,056,368, Cl. 55-2.000.

Kelso, Inc.: *See*—
Linam, Richard L.; and Lucas, Leonard J., 4,056,705, Cl. 219-125.00R.

Kempe, Horst: *See*—
Schneider, Siegfried; Thate, Kurt; Geyken, Erwin; Kempe, Horst; and Macher, Stephan, 4,055,879, Cl. 29-123.000.

Kendig, Ray C.: *See*—
Garrick, John R.; and Kendig, Ray C., 4,056,647, Cl. 428-134.000.

Kenton, Joseph R., to Phillips Petroleum Company. Fertilizer solutions containing stabilized iron. 4,056,381, Cl. 71-36.000.

Kerb, Ulrich; Wiechert, Rudolf; Wachtel, Helmut; Engelfried, Otto; and Kieslich, Klaus, to Schering Aktiengesellschaft. D-homo-20-ketopregnanes and method for inducing anesthesia or narcosis. 4,056,633, Cl. 424-331.000.

Kerr, Ralph O., to Petro-Tex Chemical Corporation. Vanadium phosphorus oxygen oxidation catalysts useful for preparing anhydrides from alkanes. 4,056,487, Cl. 252-435.000.

Khachatrian, Saribek Saakovich: *See*—
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Sato, Masamichi; Kido, Keishiro; and Arai, Noboru, 4,056,395, Cl. 96-36.000.

Kienzle Apparate GmbH: *See*—
Scholl, Hans-Peter; Heimburger, Alfons; Warkentin, Ulrich; and Saufferer, Manfred, 4,056,709, Cl. 235-30.00R.

Kieslich, Klaus: *See*—
Kerb, Ulrich; Wiechert, Rudolf; Wachtel, Helmut; Engelfried, Otto; and Kieslich, Klaus, 4,056,633, Cl. 424-331.000.

Kijowski, John: *See*—
Kirkpatrick, John; and Kijowski, John, 4,056,399, Cl. 106-69.000.

Kimberly-Clark Corporation: *See*—
Kaczmarzyk, Leonard M.; Hlaban, James J.; and McKelvey, Patricia J., 4,056,103, Cl. 128-285.000.

Kimura, Kazuhiko: *See*—
Ito, Kiyoshi; Ikemoto, Masahiko; Kimura, Kazuhiko; and Nakanishi, Teruo, 4,056,626, Cl. 424-285.000.

Kimura, Takeji: *See*—
Inoue, Michihiro; Kimura, Takeji; Sato, Masaharu; and Tsunoo, Masahiko, 4,056,033, Cl. 84-1.240.

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Pow, Robert Marvin, 4,056,283, Cl. 298-17.600.

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Sonderegger, Hans Conrad; and Baumgartner, Hans Ulrich, 4,056,009, Cl. 73-406.000.

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Sakakibara, Sakuichi; Sugisawa, Ko; and Kitamura, Yukio, 4,056,566, Cl. 426-577.000.

Kitano, Hisao: *See*—
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Kitaoka, Shigeo; Johkoh, Katsuhiro; Ebisawa, Hisashi; Sato, Tadashi; Kubo, Hiroshi; Takahashi, Sosuke; and Kawase, Yoshinobu, to Showa Denko K.K. Method of combatting ticks. 4,056,631, Cl. 424-330.000.

KKF Corporation: *See*—
Kompanek, Harry Wilfred, 4,056,654, Cl. 428-409.000.

Klassen, Horst Willi: *See*—
Wienand, Hans-Jurgen; and Klassen, Horst Willi, 4,056,174, Cl. 188-73.500.

Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Process for the preparation of tertiary phosphine oxides. 4,056,571, Cl. 260-583.00E.

Kleinhenz, Karl: *See*—
Weicht, Bodo; and Kleinhenz, Karl, 4,056,444, Cl. 203-26.000.

Klemm, Karl: *See*—
Barzynski, Helmut; Heil, Guenter; Klemm, Karl; and Sander, Helfrid, 4,056,453, Cl. 204-159.230.

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Gamus, Abraham; and Knecevic, Zoran, 4,056,277, Cl. 292-341.160.

Kniat, John, to United Technologies Corporation. Means for calculating turbine inlet temperature of a gas turbine engine. 4,055,997, Cl. 73-117.300.

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Koayama, Masaharu: *See*—
Misono, Masayoshi; Koayama, Masaharu; and Asida, Tutomu, 4,056,306, Cl. 350-160.0LC.

Kobayashi, Shoji: *See*—
Izumi, Ryoji; Kobayashi, Shoji; Ono, Toshiharu; Shirato, Toru; Fujii, Akiyoshi; and Okihara, Tadashi, 4,056,592, Cl. 264-141.000.

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Mochimaru, Hideaki; and Kobayashi, Yugoro, 4,056,320, Cl. 355-75.000.

Kobe Steel, Ltd.: *See*—
Harada, Nobuhiko; Tanaka, Minetaka; Shimano, Masanao; Fujinaga, Kyozo; Nunomura, Kunito; Tamura, Masamitu; Nakamura, Shigeharu; and Akagi, Kazuo, 4,056,428, Cl. 156-642.000.

Kobesky, Lawrence Joseph: *See*—
Callahan, Robert William; Kauffman, Paul Eugene; Kobesky, Lawrence Joseph; and Page, Howard Loomis, 4,056,846, Cl. 364-200.000.

Kofman, Izrail Zalmanovich: *See*—
Vulikh, Alexandr Ilich; Zagorskaya, Maina Konstantinovna; Kofman, Izrail Zalmanovich; Pavlovich, Inna Vasilievna; Levitan, Boris Veniaminovich; Troyan, Nikolai Vasilievich; and Dubyaga, Sergei Viktorovich, 4,056,605, Cl. 423-484.000.

Kogane, Yutaka: *See*—
Aihara, Mitsugu; Kogane, Yutaka; Ebinuma, Yasumitsu; and Minami, Masaki, 4,056,680, Cl. 174-19.000.

Kogure, Hiromasa: *See*—
Tobise, Masahiro; Kogure, Hiromasa; Kanbara, Tadahiko; and Koseki, Hiroshi, 4,056,767, Cl. 363-141.000.

Kohl, Edgar: *See*—
Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, 4,056,375, Cl. 55-381.000.

Kohl, Karl. Linkage system for warp knitting machine. 4,056,012, Cl. 74-81.000.

Koike, Kozo: *See*—
Doi, Kunio; Koike, Kozo; and Sasaki, Toshiro, 4,056,339, Cl. 418-178.000.

Kokke, Antoine H.: *See*—
Dmitrovsky, Morris; and Kokke, Antoine H., 4,056,364, Cl. 23-273.00R.

Kolaian, Jack H.; McCoy, Frederic C.; and Patterson, John A., to Texaco Inc. Detergent formulations and their use. 4,056,355, Cl. 8-137.000.

Kolbasin, Alexei Yakovlevich: *See*—
Boyadzhian, Varazdat Karapetovich; Khachatrian, Saribek Saakovich; Stepanian, Genrikh Gevorkovich; Eritsian, Volodya Karapetovich; Agavelian, Edik Stepanovich; Nefedov, Oleg Matveevich; Dolgy, Igor Evgenievich; Sisin, Mikhail Fedorovich; Kolbasin, Alexei Yakovlevich; and Anikeev, Ivan Konstantinovich, 4,056,563, Cl. 560-245.000.

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Gregory, Reginald; and Kolombos, Alexander John, 4,056,575, Cl. 260-673.500.
Gregory, Reginald; and Kolombos, Alexander John, 4,056,576, Cl. 260-683.300.

Kolomoets, Nikolai Vasilievich: *See*—
Markman, Mikhail Abramovich; Simanovsky, Leonid Mikhailovich; Jurkevich, Igor Rostislavovich; Kolomoets, Nikolai Vasilievich; Kamensky, Vyacheslav Tikhonovich; Matskov, Igor Mikhailovich; and Maximov, Sergei Ilich, 4,056,406, Cl. 136-208.000.

Kompanek, Harry Wilfred, to KKF Corporation. Coating compositions, processes for depositing the same, and articles resulting therefrom. 4,056,654, Cl. 428-409.000.

Konnerth, Ernst: *See*—
Kaiser, Hans; Konnerth, Ernst; and Kramer, Gert, 4,056,343, Cl. 425-112.000.

Konrad, Albert. Apparatus for producing a connection between two overlapping band sections of a package strip and improved closure seal for use therewith. 4,056,128, Cl. 140-93.400.

Koponen, Martti; and Soikkanen, Pertti, to Valmet Oy. Ascending twin-wire paper machine without web pick-up. 4,056,433, Cl. 162-290.000.

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League, John S., IV, 4,056,417, Cl. 156-64.000.

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Korb, Donald R.: *See*—
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,056,496, Cl. 260-29.6TA.
Kosaka, Katuaki: *See*—
Ueno, Zene; Kosaka, Katuaki; and Wagatsuma, Fumio, 4,056,086, Cl. 123-122.00R.
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Kotuby, Paul M., to Risdon Manufacturing Company, The. Liquid dispensing pump automatically sealable against leakage. 4,056,216, Cl. 222-385.000.
Koury, Federic: *See*—
Gungle, W. Calvin; Koury, Federic; and Keeffe, William M., 4,056,751, Cl. 313-217.000.
Krafft, Werner; Wolff, Erich; and von Bonin, Wulf, to AGFA-Gevaert, A.G. Dye diffusion transfer material with graft polymer binding layer. 4,056,397, Cl. 96-77.000.
Kraft, Derald H., to Aspro, Inc. Method of roller spinning cup-shaped metal blanks and roller construction therefor. 4,055,976, Cl. 72-83.000.
Kraft, Derald H., to Aspro, Inc. Sintered pulley hub construction and method of making same. 4,056,014, Cl. 74-230.400.
Kraft, Derald H.; and St. John, Richard C., to Aspro, Inc. Clutch housing and bearing assembly and method of making the same. 4,056,291, Cl. 308-189.00R.
Krahe, Jurgen: *See*—
Kamann, Gunther; Krahe, Jurgen; Zischinsky, Ulf; and Gotze, Wilhelm, 4,056,036, Cl. 85-63.000.
Kramer, Bruno: *See*—
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Kramer, Gert: *See*—
Kaiser, Hans; Konnerth, Ernst; and Kramer, Gert, 4,056,343, Cl. 425-112.000.
Kramer, Kimball: *See*—
Bobb, Lloyd C.; and Kramer, Kimball, 4,056,290, Cl. 307-88.300.
Krasikov, Anatoly Nikolaevich: *See*—
Bukrinsky, Anatoly Matveevich; Matskevich, Genrikh Vladimirovich; Rzheznikov, Julian Vulfovich; Sukhov, Andrei Borisovich; Tatarnikov, Viktor Petrovich; Berkovich, Viktor Mozesovich; Remzhin, Jury Nikolaevich; Slepnev, Lev Nikolaevich; Sverdlov, Alexandr Anatolievich; Karan, Vladimir Geselevich; Kaloshin, Jury Petrovich; Krasikov, Anatoly Nikolaevich; Babenko, Evgeny Akimovich; Bronnikov, Vladimir Konstantinovich; Shvyryaev, Jury Vasilievich; and Shiryaev, Boris Semenovich, 4,056,436, Cl. 176-38.000.
Kraus, Edmund J.: *See*—
Kraus, Robert A.; and Kraus, Edmund J., 4,055,948, Cl. 60-641.000.
Kraus, Robert A.; and Kraus, Edmund J. Solar thermal-radiation, absorption and conversion system. 4,055,948, Cl. 60-641.000.
Krenzer, John, to Velsicol Chemical Corporation. Thiaoiazolyltetrahydropyrimidinone herbicides. 4,056,383, Cl. 71-90.000.
Krieger, George H., to St. Louis Diecasting Corporation. Die cast bat with rod. 4,056,267, Cl. 273-72.00A.
Kroebel, Reinhard: *See*—
Schmieder, Helmut; and Kroebel, Reinhard, 4,056,482, Cl. 252-301.10W.
Kronstein, Max; and Eichberg, Joseph, to American Lecithin Company. Joint suspensions of mixed pigmentations achieved by active effects of plant phosphatides. 4,056,494, Cl. 260-22.00A.
Kubo, Hiroshi: *See*—
Kitaoka, Shigeo; Johkoh, Katsuhiro; Ebisawa, Hisashi; Sato, Tadashi; Kubo, Hiroshi; Takahashi, Sosuke; and Kawase, Yoshinobu, 4,056,631, Cl. 424-330.000.
Kubrin, Michael J.: *See*—
Pohto, Gerald R.; Kubrin, Michael J.; and Sutter, Robert C., 4,056,458, Cl. 204-263.000.
Kudo, Hirokatu: *See*—
Okamoto, Kintaro; Kudo, Hirokatu; Ishijimi, Soichi; Kadoiri, Etsuro; Soma, Hiroshi; and Suzuki, Hiroyuki, 4,056,165, Cl. 181-141.000.
Kufner, Kenneth L.: *See*—
Fusco, Vito A.; Bennett, Joseph C.; Funcik, Jack F.; Kufner, Kenneth L.; and Schneider, Thomas E., 4,055,889, Cl. 29-710.000.
Kulhanek, Frank C., to United States of America, Energy Research and Development Administration. Altitude release mechanism. 4,056,000, Cl. 73-170.00R.
Kulkarni, Shrikant V.: *See*—
Gordon, Paul; Ronsen, Bruce; and Kulkarni, Shrikant V., 4,056,322, Cl. 536-4.000.
Kume, Makoto, to Nippon Sheet Glass Co., Ltd. Method for decorative coloring of glass. 4,056,643, Cl. 427-226.000.
Kurami, Kenshi: *See*—
Imabuchi, Yoshihisa; Kurami, Kenshi; Akiyama, Yoshinori; and Sobajima, Katsunobu, 4,056,271, Cl. 280-745.000.
Kuroyanagi, Yoshitaka: *See*—
Makino, Takayuki; Yamanaka, Teruo; Kuroyanagi, Yoshitaka; and Teratani, Tatsuo, 4,056,782, Cl. 325-313.000.
Kusakata, Shigeru: *See*—
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; and Takahashi, Michihisa, 4,056,824, Cl. 354-300.000.
La Telemecanique Electrique: *See*—
Lefebvre, Marcel; and Rouquet, Alain, 4,056,769, Cl. 324-236.000.
La Bate, Micheal Donald. Method of rebuilding an ingot mold. 4,055,881, Cl. 29-401.00A.
Lace, Donald A. Valve actuator. 4,056,255, Cl. 251-129.000.
Lacey, Edward H. Irrigation hose and belt splice preparing tool. 4,056,021, Cl. 83-4.000.
Lacey, Patrick J. Drill bit for reinforced concrete. 4,056,152, Cl. 175-330.000.
Lacy, James Volney: *See*—
Angner, Ronald Joseph; and Lacy, James Volney, 4,056,695, Cl. 179-99.000.
Lademann, Rudolf; Landauer, Franz; Lenzmann, Heinrich; Schmiedel, Klaus; and Schwiersch, Wolfram, to Hoechst Aktiengesellschaft. Process for the continuous preparation of mono- or di-(trichloromethyl)-benzenes. 4,056,455, Cl. 204-163.00R.
Laguna de Rins, Fernando Almarza. Safety fuse for underwater artefacts. 4,056,058, Cl. 102-16.000.
Lahourcade, Bernard; and Bonneau, Gustave, to Les Derives Resiniques et Terpeniques. Process for the preparation of terpene-phenol resins by three-stage reaction of phenol with carene using Friedel-Crafts or Lewis acid catalyst. 4,056,513, Cl. 260-62.000.
Lallement, Jean: *See*—
Gama, Jean-Michel; Lallement, Jean; and Pugnet, Lucien, 4,056,438, Cl. 176-50.000.
Lamar, William Paul. Method and apparatus for programming microprocessors. 4,056,711, Cl. 364-200.000.
Lamberti, Vincent; and Gutierrez, Eddie N., to Lever Brothers Company. Chemical processes for preparing citric acid. 4,056,567, Cl. 260-535.00P.
Lambright, A. James: *See*—
Goettler, Lloyd A.; and Lambright, A. James, 4,056,591, Cl. 264-108.000.
Landauer, Franz: *See*—
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Landis Lund, Limited: *See*—
Bottomley, Herbert Geoffrey, 4,056,064, Cl. 104-93.000.
Landsman, Emanuel. Combination brush and paste dispenser. 4,056,110, Cl. 132-84.00R.
Lange, Wolfgang: *See*—
Bauer, Andreas; and Lange, Wolfgang, 4,056,280, Cl. 296-146.000.
Lapitsky, Jury Anatolievich: *See*—
Bashkirov, Andrei Nikolaevich; Grozhan, Mark Markovich; Kamzolkin, Vladimir Vasilievich; Lapitsky, Jury Anatolievich; and Vygodskaya, Irina Vladimirovna, 4,056,572, Cl. 260-624.00R.
Laporte Industries Limited: *See*—
Beach, Anthony John; Eveson, Geoffrey Frank; and Leedham, Reginald Keith, 4,056,704, Cl. 219-121.00P.
Larsen, Donald W., to W. R. Grace & Co. Curable polyene-polythiol compounds and methods for preparation and curing. 4,056,548, Cl. 260-455.00R.
Lassman, Howard B.; and Novick, William J., Jr., to American Hoechst Corporation. Method of treating dermal inflammation. 4,056,624, Cl. 424-274.000.
Latassa, Frank M., to GTE Sylvania Incorporated. Mercury dispenser for discharge lamps. 4,056,750, Cl. 313-177.000.
Latour, Mirelle: *See*—
Bonneau, Pierre; and Latour, Mirelle, 4,056,614, Cl. 424-105.000.
Latus, Hans; Hemala, Zdenek; Bleeck, Heinz; and Weber, Rolf Dieter, to Saurer-Allma GmbH Allgaeuer Maschinenbau. Double twist thread twisting frame. 4,055,937, Cl. 57-34.00R.
Lauer, William: *See*—
Mouwen, Herman Charles; Lauer, William; and Weinberg, Steven Louis, 4,056,476, Cl. 210-446.000.
Laurel Bank Machine Co., Ltd.: *See*—
Yoshida, Minoru, 4,056,193, Cl. 211-51.000.
Laurito, James J., to Neville Chemical Company. Production of novel resins and their uses in printing ink compositions. 4,056,498, Cl. 260-23.70C.
Lavallee, Francois A., to General Electric Company. Alpha-cyanoethylphthalate and preparation thereof. 4,056,550, Cl. 260-465.00D.
LaWhite, Eric L.; Henrichon, Ernest G., Jr.; and Bloom, Harvey J., to Xicon Data Entry Corporation. Drumless paper transporter. 4,056,263, Cl. 271-3.000.
Lawrence, Walter Phalti: *See*—
Fremont, Henry A.; and Lawrence, Walter Phalti, 4,056,342, Cl. 425-80.000.
Leach, Ronald W. A., to Shell Oil Company. Alanine derivatives as sugar cane ripeners. 4,056,385, Cl. 71-111.000.
League, John S., IV, to Koppers Company, Inc. Open loop heating controller and method for corrugators. 4,056,417, Cl. 156-64.000.
Leamy, Harry John: *See*—
Chen, Ho Sou; Gyorgy, Ernst Michael; Leamy, Harry John; and Sherwood, Richard Curry, 4,056,411, Cl. 148-121.000.
Leandri, Jacqueline Agathe Marie: *See*—
Rey, Pierre Theodore Joseph; Leandri, Jacqueline Agathe Marie; and Abbou, Clement Claude, 4,056,095, Cl. 128-1.00R.
Leary, David F.: *See*—
Miertschin, Gary N.; and Leary, David F., 4,056,584, Cl. 264-.500.
LeBoutet, Hubert, to C.G.R.-Mev. Magnetic deflecting and focusing device for a charged particle beam. 4,056,728, Cl. 250-396.00R.

Leckie, Harry P.; Sievert, William C.; and Legault, Robert A., to Inland Steel Company. Zinc-aluminum eutectic alloy coated ferrous strip. 4,056,657, Cl. 428-659.000.

Leckie, Harry P.: *See*—
Lee, Harvie Ho; Gomersall, David W.; and Leckie, Harry P., 4,056,366, Cl. 29-653.000.

Leclercq, Xavier: *See*—
Carpentier, Alain; Leclercq, Xavier; and Paris, Jean, 4,055,861, Cl. 3-1.500.

Leco Corporation: *See*—
Berk, Charles W.; and Vallance, Charles B., 4,056,677, Cl. 13-23.000.

Lee, Harvie Ho; Gomersall, David W.; and Leckie, Harry P., to Inland Steel Company. Zinc-aluminum alloy coating and method of hot-dip coating. 4,056,366, Cl. 29-653.000.

Leedham, Reginald Keith: *See*—
Beach, Anthony John; Eveson, Geoffrey Frank; and Leedham, Reginald Keith, 4,056,704, Cl. 219-121.00P.

Lefebvre, Marcel; and Rouquet, Alain, to La Telemecanique Electrique. Direct current proximity detector having switching means which provide on two distinct outputs, signals when the target is located beyond or within a predetermined range. 4,056,769, Cl. 324-236.000.

Legault, Robert A.: *See*—
Leckie, Harry P.; Sievert, William C.; and Legault, Robert A., 4,056,657, Cl. 428-659.000.

Leib, Michael J., to Westinghouse Electric Corporation. In-band signal-to-noise ratio monitor for an FSK relaying system. 4,056,838, Cl. 361-68.000.

Leibson, Irving: *See*—
Fox, Joseph M., III; Degen, Bruce D.; and Leibson, Irving, 4,056,599, Cl. 423-178.000.

Leisterer, Reinhard; Oelfke, Manfred; Woiczik, Hans; Meyer, Hans-Joachim; and Ostermeier, Rolf, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Apparatus for locating sources of sound in water. 4,056,801, Cl. 340-2.000.

Lemelson, Jerome H. Apparatus for producing composite extrusions. 4,056,344, Cl. 425-132.000.

Lenzmann, Heinrich: *See*—
Lademann, Rudolf; Landauer, Franz; Lenzmann, Heinrich; Schmiedel, Klaus; and Schwiersch, Wolfram, 4,056,455, Cl. 204-163.00R.

Les Derives Resiniques et Terpeniques: *See*—
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Levenback, George: *See*—
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Lever Brothers Company: *See*—
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Leveugle, Roland, to Croon & Lucke Maschinenfabrik GmbH & Co. KG. Band applying device for a skein winding machine. 4,055,934, Cl. 53-198.00B.

Levinson, Melvin; and Salkoff, Goodwin. Spring actuated medical injector. 4,056,102, Cl. 128-218.00F.

Levitan, Boris Veniaminovich: *See*—
Vulikh, Alexandr Ilich; Zagorskaya, Maina Konstantinovna; Kofman, Izrail Zalmanovich; Pavlovich, Inna Vasilievna; Levitan, Boris Veniaminovich; Troyan, Nikolai Vasilievich; and Dubyaga, Sergei Viktorovich, 4,056,605, Cl. 423-484.000.

Lewis, John Hopkins. Apparatus for selectively modulating the color of light beam paths of photographic color recorders. 4,056,317, Cl. 355-32.000.

Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., to Argus Chemical Corporation. Thermally stable high molecular weight acyl peroxycarbonic esters in vulcanization of silicone rubber. 4,056,561, Cl. 260-46.50G.

Lewis, Sheldon N.; and Haggard, Richard A., to Rohm and Haas Company. Novel polymers of alkyl methacrylates. 4,056,559, Cl. 526-212.000.

Leybold-Heraeus GmbH & Co. KG: *See*—
Marx, Joachim, 4,055,984, Cl. 73-40.700.

Li, Norman N.; and Cahn, Robert P., to Exxon Research and Engineering Company. Separating hydrocarbon mixtures by emulsification. 4,056,462, Cl. 208-308.000.

"Licencia" Talalmanyokat Ertekesito Vallalat: *See*—
Mandoki, Andor, 4,056,703, Cl. 219-71.000.

Lieber, Jean, to Ateliers des Charmilles S.A. Method for adjusting the output of a pump provided with an adjustable spray cone with movable blades. 4,056,330, Cl. 415-1.000.

Likens Manufacturing Co.: *See*—
Likens, Robert; and Boehm, William S., 4,056,130, Cl. 141-67.000.

Likens, Robert; and Boehm, William S., to Likens Manufacturing Co. Volumetric bagging apparatus. 4,056,130, Cl. 141-67.000.

Lin, Chii-Fa, to Stauffer Chemical Company. Air freshener gels. 4,056,612, Cl. 424-76.000.

Linam, Richard L.; and Lucas, Leonard J., to Kelso, Inc. Apparatus for controlling the welding pattern between weldment components. 4,056,705, Cl. 219-125.00R.

Linde Aktiengesellschaft: *See*—
Abels, Theodor; and Puschel, Siegfried, 4,056,160, Cl. 180-143.000.

Lindemann Maschinenfabrik GmbH: *See*—
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Mochimaru, Hideaki; and Kobayashi, Yugoro, to Ricoh Company, Ltd. Copying machine. 4,056,320, Cl. 355-75.000.
Mody, Amrut Vithaldas: *See*—
Vora, Vinay Chhotalal; and Mody, Amrut Vithaldas, 4,056,615, Cl. 424-120.000.
Moessner, Frank G., to Unican Security Systems, Ltd. Key assembly tool. 4,055,880, Cl. 29-267.000.
Mohawk Video Systems Corporation: *See*—
Carpenter, Anthony P., 4,056,470, Cl. 210-94.000.
Mohr, Adolf; Sohn, Wolfgang; and Strobl, Georg, to Robert Bosch GmbH. Dynamo electric machine permanent magnet flux test apparatus which simulates actual flux conditions of the motor. 4,056,770, Cl. 324-205.000.
Moldex, Inc.: *See*—
Paine, Ellis H., 4,056,419, Cl. 156-164.000.

Molex Incorporated: *See—*
Fusco, Vito A.; Bennett, Joseph C.; Funcik, Jack F.; Kufner, Kenneth L.; and Schneider, Thomas E., 4,055,889, Cl. 29-710.000.

Molins Limited: *See—*
Bennett, George Robert, 4,056,206, Cl. 214-302.000.

Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, to Bayer Aktiengesellschaft. Pyrazol-5-ones. 4,056,533, Cl. 548-360.000.

Molnar, Louis: *See—*
Canters, Gregorio Asua; Reparaz, Jose M. Palacios; and Molnar, Louis, 4,056,387, Cl. 75-123.00F.

Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr., 4,056,424, Cl. 156-384.000.

Moncrieff-Yeates, Alexander John. Vortical flow aerothermodynamic fireplace unit. 4,056,091, Cl. 126-121.000.

Monroe, Marvin E.: *See—*
Jacoby, Benjamin Franklin; and Monroe, Marvin E., 4,056,761, Cl. 318-116.000.

Monsanto Company: *See—*
Goettler, Lloyd A.; and Lambright, A. James, 4,056,591, Cl. 264-108.000.
Herber, John F., 4,056,480, Cl. 252-78.500.

Montedison, S.p.A.: *See—*
Corradi, Ariello Rolando; and Fagherazzi, Giuliano, 4,056,410, Cl. 148-105.000.

Montgomery Ward & Co., Incorporated: *See—*
Godlewski, Walter A.; Roser, Bernard S.; and Lyons, John B., 4,056,294, Cl. 312-30.000.

Moore, Anthony John. Presses. 4,056,341, Cl. 425-77.000.

Moore Business Forms, Inc.: *See—*
Weisenfluh, John A., 4,056,191, Cl. 206-629.000.

Moore, Paul B.: *See—*
Swenson, Paul F.; and Moore, Paul B., 4,055,964, Cl. 62-238.000.

Morasch, Ronald J.; and Webb, Robert J., to Medalist Industries, Inc. Method and apparatus for cutting tenons. 4,056,137, Cl. 144-323.000.

Morelli, Basilio: *See—*
Papoff, Paolo; Morelli, Basilio; and Guidarini, Dante, 4,056,258, Cl. 366-160.000.

Morex, Inc.: *See—*
Morrill, Vaughan, Jr.; and Jackes, Stanley F., 4,055,888, Cl. 29-622.000.

Morgan Construction Company: *See—*
Hill, William J., 4,056,186, Cl. 198-339.000.

Morimasa, Yuki: *See—*
Hagiwara, Yoshihide; Tetsuji, Miyauchi; and Morimasa, Yuki, 4,056,637, Cl. 426-52.000.

Moring, Peter Lothar Ernst, to Dunlop Limited. Belting. 4,056,016, Cl. 74-231.00J.

Morley Furniture Spring Corporation: *See—*
Crosby, Lawton H.; and Keane, Thomas H., 4,055,865, Cl. 5-259.00R.

Morrill, Charles Donovan. Seal. 4,056,272, Cl. 285-140.000.

Morrill, Vaughan, Jr.; and Jackes, Stanley F., to Morex, Inc. Process for making reed switches. 4,055,888, Cl. 29-622.000.

Morrison, Heber J.; and Howland, Rockney W., to Westinghouse Electric Corporation. Single ended class d amplifier. 4,056,786, Cl. 330-207.00A.

Morse, Howard H.: *See—*
Scheidler, Ralph E.; and Morse, Howard H., 4,056,765, Cl. 320-48.000.

Morton, John T. Silencer device. 4,055,871, Cl. 16-86.00A.

Moser, Kurt: *See—*
Schlieckmann, Alfred; and Moser, Kurt, 4,056,122, Cl. 137-563.000.

Motorola, Inc.: *See—*
Faulkner, Thomas Edward, 4,056,780, Cl. 325-5.000.
Toler, Robert Lee, 4,056,779, Cl. 325-4.000.

Mougniot, Jean-Claude: *See—*
Giacometti, Christian; Mougniot, Jean-Claude; and Ravier, Jean, 4,056,437, Cl. 176-40.000.

Mouwen, Herman Charles; Lauer, William; and Weinberg, Steven Louis, to Johnson & Johnson; and Purolator, Inc. Blood filter media. 4,056,476, Cl. 210-446.000.

Mueller, Norbert: *See—*
Hoffman, Werner; Mueller, Norbert; and von Fraunberg, Karl, 4,056,541, Cl. 260-343.000.

Mueller, Richard A., to G. D. Searle & Co. 3,5-Bisoxygenated 2-(ω-halo-3-oxygenated-1-alkenyl)-cyclopentane-1-heptanoic acids and derivatives thereof. 4,056,562, Cl. 560-231.000.

Mukai, Junji: *See—*
Nishikawa, Akio; Yokono, Hitoshi; Numata, Shun-ichi; and Mukai, Junji, 4,056,579, Cl. 260-830.00P.

Muller, Hans. Process for the conversion of starch and protein-containing cellulosic waste products into nutrients richer in proteins. 4,056,636, Cl. 426-48.000.

Muller, Karl-Heinz: *See—*
Zorn, Jurgen; Vlemmings, Jan; Muller, Karl-Heinz; Mayer, Siegfried; Dworak, Wilhelm; Hartmann, Eugen; Fader, Martin; Talmon, Wolfgang; Jons, Claus; Sauer, Ivan; and Bosch, Paul, 4,056,337, Cl. 418-131.000.

Muller, Werner: *See—*
Heinzer, Hans; and Muller, Werner, 4,056,045, Cl. 93-35.0SB.

Munz, Werner, to Emhart Zurich S. A. Apparatus for testing the surface quality of a vessel mouth. 4,055,985, Cl. 73-49.200.

Murray, Graeme D.: *See—*
Johnson, Eric M.; Murray, Graeme D.; and Hardy, Frederick E., 4,056,113, Cl. 134-40.000.

Murray, Paul Michael: *See—*
Spooner, Archer Michael; and Murray, Paul Michael, 4,056,827, Cl. 358-87.000.

Murt, Edward M. Holder for money, cards and the like. 4,056,139, Cl. 150-39.000.

Muschelknautz, Edgar; and Nemecek, Franz, to Bayer Aktiengesellschaft. Internal friction twist device. 4,055,940, Cl. 57-77.400.

Musil, Josef: *See—*
Bartmann, Wilhelm; Beck, Gerhard; Granzer, Ernold; Musil, Josef; and Teufel, Hermann, 4,056,629, Cl. 424-327.000.

Musman, Harry Edward: *See—*
Freimanis, Laimons; Musman, Harry Edward; and Smith, DeWitt Paul, 4,056,691, Cl. 179-18.0FA.

Myers, Albert H., to Furukawa International U.S.A., Inc. Method and apparatus for providing a controlled atmosphere around perishable products. 4,055,931, Cl. 53-22.00B.

Nafco Giken, Ltd.: *See—*
Hayashi, Tsutomu, 4,056,372, Cl. 55-152.000.

Nafissi-Varchei, Mohammad Mehdi: *See—*
Reimann, Hans; Jaret, Robert S.; and Nafissi-Varchei, Mohammad Mehdi, 4,056,616, Cl. 424-180.000.

Nagase, Mitsuo: *See—*
Yamamoto, Yukio; and Nagase, Mitsuo, 4,055,916, Cl. 49-404.000.

Nakaguti, Osamu: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,056,521, Cl. 260-239.100.

Nakahashi, Ken-Ichi: *See—*
Shimizu, Hiroyuki; Inaba, Kouji; and Nakahashi, Ken-Ichi, 4,056,310, Cl. 351-6.000.

Nakamura, Shigeharu: *See—*
Harada, Nobuhiko; Tanaka, Minetaka; Shimano, Masanao; Fujinaga, Kyozo; Nunomura, Kunito; Tamura, Masamitu; Nakamura, Shigeharu; and Akagi, Kazuo, 4,056,428, Cl. 156-642.000.

Nakanishi, Teruo: *See—*
Ito, Kiyoshi; Ikemoto, Masahiko; Kimura, Kazuhiko; and Nakanishi, Teruo, 4,056,626, Cl. 424-285.000.

Nakao, Shoichi: *See—*
Mitsui, Nobuo; Watanabe, Akinori; Oohira, Takeshi; Kawauchi, Kazuhiko; Nakao, Shoichi; and Teranishi, Katsuya, 4,056,759, Cl. 318-98.000.

Nalepa, Philip J.: *See—*
McHugh, James P.; Nalepa, Philip J.; Miller, Robert C.; and Dawson, Chester W., 4,056,378, Cl. 65-18.000.

National Mine Service Company: *See—*
Freed, Donald L., Jr., 4,056,189, Cl. 198-514.000.

National Research Development Corporation: *See—*
Teasdale, Raymond Geoffrey, 4,056,472, Cl. 210-242.00S.

National Starch and Chemical Corporation: *See—*
Skoultchi, Martin M., 4,056,670, Cl. 526-320.000.

National Union Electric Corporation: *See—*
Zellhoefer, Glenn F., 4,056,662, Cl. 429-112.000.

Nederlof, Anton Marie, to U.S. Philips Corporation. Hot-gas reciprocating engine. 4,055,953, Cl. 60-526.000.

Nefedov, Oleg Matveevich: *See—*
Boyadzhian, Varazdat Karapetovich; Khachatrian, Saribek Saakovich; Stepanian, Genrikh Gevorkovich; Eritsian, Volodya Karapetovich; Agavelian, Edik Stepanovich; Nefedov, Oleg Matveevich; Dolgy, Igor Evgenievich; Sisin, Mikhail Fedorovich; Kolbasin, Alexei Yakovlevich; and Anikeev, Ivan Konstantinovich, 4,056,563, Cl. 560-245.000.

Nelson, Darrell E.: *See—*
Hoerning, John S.; Halverson, Richard P.; and Nelson, Darrell E., 4,056,809, Cl. 364-200.000.

Nemecek, Franz: *See—*
Muschelknautz, Edgar; and Nemecek, Franz, 4,055,940, Cl. 57-77.400.

Netzel, Philip C.: *See—*
Brandt, Thomas F.; Netzel, Philip C.; and Wharton, Lennard, 4,056,679, Cl. 174-13.000.

Neville Chemical Company: *See—*
Laurito, James J., 4,056,498, Cl. 260-23.70C.

New Life Foundation: *See—*
Mackenzie, Harold B.; and Anderson, Ingvar G., 4,056,202, Cl. 214-17.00C.

Newstead, Charles; Assinder, Andrew Charles; and Harvey, Geoffrey, to Girling Limited. Slack adjusters for the shoes of vehicle shoe drum brakes of the duo servo type. 4,056,175, Cl. 188-196.0BA.

Nidola, Antonio: *See—*
de Nora, Vittorio; Nidola, Antonio; and Bianchi, Giuseppe, 4,056,449, Cl. 204-106.000.

Nielsen, Donald R., to PPG Industries, Inc. Detergent compositions of trisulfosuccinic acid. 4,056,491, Cl. 252-557.000.

Nihon Spindle Seizo Kabushiki Kaisha: *See—*
Kimura, Tsuneo; and Takeshika, Shiro, 4,056,123, Cl. 137-624.140.

Nilsson, Bjarne Ivar. Rotary filter for concentrating fiber suspensions. 4,056,473, Cl. 210-331.000.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Goi, Mitsuhiro; and Miyashita, Masahiko, 4,056,551, Cl. 560-126.000.

Nippon Sheet Glass Co., Ltd.: *See—*
Kume, Makoto, 4,056,643, Cl. 427-226.000.

Nischk, Gunther: *See*—
Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, 4,056,564, Cl. 260-512.00C.
Nishibata, Atsushi: *See*—
Tanaka, Yoshiaki; Handa, Susumu; Nishibata, Atsushi; Ueda, Sadashi; Inamoto, Yoshiaki; Saito, Masahiro; Tanimoto, Fumio; and Kitano, Hisao, 4,056,547, Cl. 260-453.00P.
Nishikawa, Akio; Yokono, Hitoshi; Numata, Shun-ichi; and Mukai, Junji, to Hitachi, Ltd. Novel thermosetting resin composition and cured product therefrom. 4,056,579, Cl. 260-830.00P.
Nissan Motor Company, Limited: *See*—
Endo, Takuya; and Hirota, Toshio, 4,056,764, Cl. 320-3.000.
Imabuchi, Yoshihisa; Kurami, Kenshi; Akiyama, Yoshinori; and Sobajima, Katsunobu, 4,056,271, Cl. 280-745.000.
Sakaki, Yoshihiro, 4,056,141, Cl. 165-9.000.
Ueno, Zene; Kosaka, Katuaki; and Wagatsuma, Fumio, 4,056,086, Cl. 123-122.00R.
Nitsche, Joseph E.: *See*—
Dates, Harold F.; Domicone, Joseph J.; and Nitsche, Joseph E., 4,056,650, Cl. 428-332.000.
Nizeeva, Nellya Nikitichna: *See*—
Skvortsov, Gennady Alexeevich; Nizeeva, Nellya Nikitichna; Podzharsky, Avrum Iosifovich; and Dobrovolskaya, Irma Viktorovna, 4,056,600, Cl. 423-239.000.
Noiles, Douglas G. Fuel saving variable closed position fuel and air flow control for vehicles with automatic transmission. 4,056,082, Cl. 123-103.00R.
Noiles, Douglas G., to United States Surgical Corporation. Volume limiting chamber. 4,056,100, Cl. 128-214.00C.
Norden, Alexander R. Retained screw assembly. 4,056,301, Cl. 339-263.00R.
Nordh, Rolf Goran, to Hakanssons Manufaktur AB. Safety harness for motor vehicles. 4,056,282, Cl. 297-389.000.
Nordisk Ventilator Co., A/S: *See*—
Roslyng, Ole; and Dam, Niels Erik Friis, 4,055,994, Cl. 73-116.000.
Northrop, Tom A. Cutting device. 4,056,027, Cl. 83-455.000.
Norton Company: *See*—
King, John H., 4,055,860, Cl. 2-416.000.
Novick, William J., Jr.: *See*—
Lassman, Howard B.; and Novick, William J., Jr., 4,056,624, Cl. 424-274.000.
Novy, Russell F.: *See*—
Beall, Benjamin S., III; and Novy, Russell F., 4,056,678, Cl. 13-25.000.
Nowroski, Alvin P.; and Root, Lyman V., to Ford Motor Company. Engine positive crankcase ventilation valve assembly. 4,056,085, Cl. 123-119.00B.
Nuclear Engineering Co., Inc.: *See*—
Gablin, Kenneth A.; and Hansen, Larry J., 4,056,362, Cl. 23-260.000.
Numata, Shun-ichi: *See*—
Nishikawa, Akio; Yokono, Hitoshi; Numata, Shun-ichi; and Mukai, Junji, 4,056,579, Cl. 260-830.00P.
Nunomura, Kunito: *See*—
Harada, Nobuhiko; Tanaka, Minetaka; Shimano, Masanao; Fujinaga, Kyozo; Nunomura, Kunito; Tamura, Masamitu; Nakamura, Shigeharu; and Akagi, Kazuo, 4,056,428, Cl. 156-642.000.
Nussbaum, Alexander Leopold: *See*—
Heimer, Edgar Philip; and Nussbaum, Alexander Leopold, 4,056,673, Cl. 536-27.000.
N.V. Appingedammer Bronsmotorenfabriek: *See*—
Meijer, Johann Daniel, 4,056,150, Cl. 173-127.000.
O'Brien, Charles, Jr.: *See*—
Rabelos, Nicholas A., 4,056,166, Cl. 182-5.000.
Oddsen, Robert. Automatic surveillance system for time sequence operations. 4,056,818, Cl. 340-309.400.
Odetics, Inc.: *See*—
Schulz, Gordon, 4,056,833, Cl. 360-85.000.
Oeffinger, Thomas R.; and Tocci, Leonard R., to Rockwell International Corporation. Passive chevron replicator. 4,056,813, Cl. 365-12.000.
Oelfke, Manfred: *See*—
Leisterer, Reinhard; Oelfke, Manfred; Woiczik, Hans; Meyer, Hans-Joachim; and Ostermeier, Rolf, 4,056,801, Cl. 340-2.000.
Ogden, John: *See*—
Roe, Alfred W.; Ogden, John; and Carter, Robert, 4,056,235, Cl. 220-4.00E.
Ohigashi, Tugio; and Ariga, Junichi, to Matsushita Electric Industrial Co., Ltd. Channel selection mechanism for an electronic tuner. 4,056,794, Cl. 334-15.000.
Ohio State University Research Foundation, The: *See*—
Gassman, Paul G., 4,056,569, Cl. 260-558.00S.
Okabe, Yukio: *See*—
Watanabe, Yasuaki; Okabe, Yukio; and Hayakawa, Mitsuru, 4,056,826, Cl. 358-19.000.
Okamoto, Kintaro; Kudo, Hirokatu; Ishijimi, Soichi; Kadoiri, Etsuro; Soma, Hiroshi; and Suzuki, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha; and Pioneer Electronic Corporation. Sound reproducing apparatus in the inside of a car. 4,056,165, Cl. 181-141.000.
Okamoto, Toyoo: *See*—
Ariyama, Kenzo; Ota, Sakae; Ikeda, Sunao; and Okamoto, Toyoo, 4,056,315, Cl. 355-10.000.
Okihara, Tadashi: *See*—
Izumi, Ryoji; Kobayashi, Shoji; Ono, Toshiharu; Shirato, Toru; Fujii, Akiyoshi; and Okihara, Tadashi, 4,056,592, Cl. 264-141.000.
Oku, Teruo: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, 4,056,521, Cl. 260-239.100.
Olin Corporation: *See*—
Cramer, Robert J.; and Raymond, Maurice A., 4,056,403, Cl. 134-22.00R.
Olinkraft, Inc.: *See*—
Decrane, Charles E., 4,056,132, Cl. 141-285.000.
Olson, Barry W. Portable guardrail straightener for field use. 4,055,981, Cl. 72-415.000.
Olsson, Karl Erik; and Sehman, Bengt, to ASEA Aktiebolag. Combination of a thyristor connection and a test device. 4,056,776, Cl. 324-158.0SC.
Olympus Optical Co. Ltd.: *See*—
Ikeda, Masachika, 4,056,829, Cl. 358-256.000.
Shimizu, Hiroyuki; Inaba, Kouji; and Nakahashi, Ken-Ichi, 4,056,310, Cl. 351-6.000.
Omino, Teiji: *See*—
Jojima, Teruomi; Tsuji, Hideakira; Yamamoto, Shinjiro; and Omino, Teiji, 4,056,617, Cl. 424-200.000.
Omnithruster Inc.: *See*—
Dashew, Stanley A.; and Sutton, Charles D., 4,056,073, Cl. 114-151.000.
O'Neill, John H., Jr., to Milliken Research Corporation. Dyeing method. 4,055,868, Cl. 8-150.000.
Ono, Toshiharu: *See*—
Izumi, Ryoji; Kobayashi, Shoji; Ono, Toshiharu; Shirato, Toru; Fujii, Akiyoshi; and Okihara, Tadashi, 4,056,592, Cl. 264-141.000.
Oohira, Takeshi: *See*—
Mitsui, Nobuo; Watanabe, Akinori; Oohira, Takeshi; Kawauchi, Kazuhiko; Nakao, Shoichi; and Teranishi, Katsuya, 4,056,759, Cl. 318-98.000.
O'Rear, Jacques G.: *See*—
Griffith, James R.; and O'Rear, Jacques G., 4,056,560, Cl. 260-465.00D.
Orient Chemical Industries, Ltd.: *See*—
Maekawa, Yoshihiro, 4,056,530, Cl. 260-267.000.
Oronzio de Nora Impianti Elettrochimici S.p.A.: *See*—
Giuffre, Luigi; De Nora, Vittorio; and Spaziante, Placido, 4,056,447, Cl. 204-98.000.
Orris, Stephen Jay; and Miesterfeld, Frederick Otto Richard, to Chrysler Corporation. Speed sensor. 4,056,747, Cl. 310-155.000.
Ostermeier, Rolf: *See*—
Leisterer, Reinhard; Oelfke, Manfred; Woiczik, Hans; Meyer, Hans-Joachim; and Ostermeier, Rolf, 4,056,801, Cl. 340-2.000.
Ota, Sakae: *See*—
Ariyama, Kenzo; Ota, Sakae; Ikeda, Sunao; and Okamoto, Toyoo, 4,056,315, Cl. 355-10.000.
O'Toole, Jerome: *See*—
Hedstrom, Norman; Wright, David; and O'Toole, Jerome, 4,056,296, Cl. 312-184.000.
Otto, Friedrich, to A. Stephan U. Sohne GmbH & Co. Method and apparatus for making confectioneries. 4,056,640, Cl. 426-573.000.
Overman, Kelly C.: *See*—
Brown, Joel E.; and Overman, Kelly C., 4,056,788, Cl. 331-78.000.
Owens-Illinois, Inc.: *See*—
Schmersal, Larry J.; and Johnson, William E., 4,056,806, Cl. 340-166.0EL.
Taylor, Lynn J., 4,056,499, Cl. 260-23.00H.
Taylor, Lynn J.; and Tobias, John W., 4,056,665, Cl. 526-1.000.
P. R. Mallory & Co. Inc.: *See*—
Blanchard, James S.; and Kapper, Charles E., 4,056,744, Cl. 310-51.000.
Jaffe, Sol Samson, 4,056,664, Cl. 429-217.000.
Schlaikjer, Carl Roger, 4,056,663, Cl. 429-197.000.
Pacific Resins & Chemicals, Inc.: *See*—
Miller, John F.; and Conner, Rodney R., 4,056,431, Cl. 162-165.000.
Package Machinery Company: *See*—
Provost, Richard H., 4,056,200, Cl. 214-7.000.
Schoppee, Lawrence W., 4,056,199, Cl. 214-6.0BA.
Packaging Corporation of America: *See*—
Williams, Michael M., 4,056,223, Cl. 229-32.000.
Padget, John Christopher: *See*—
Ballard, Denis George Harold; Jones, Eric; Padget, John Christopher; Pioli, Alexander Joseph Peter; Robinson, Peter Anthony; Walker, John; and Wyatt, Ronald John, 4,056,669, Cl. 526-154.000.
Page, Howard Loomis: *See*—
Callahan, Robert William; Kauffman, Paul Eugene; Kobesky, Lawrence Joseph; and Page, Howard Loomis, 4,056,846, Cl. 364-200.000.
Pahl, Karl-Heinz, to Pahl'Sche Gummi-und Asbest-Gesellschaft "Paguag". Continuous method for making hose with destruction of mandrel. 4,056,596, Cl. 264-166.000.
Pahl'Sche Gummi-und Asbest-Gesellschaft "Paguag": *See*—
Pahl, Karl-Heinz, 4,056,596, Cl. 264-166.000.
Paige, Walter Griffin, to Burroughs Corporation. Electrical connector. 4,056,299, Cl. 339-95.00D.
Paine, Ellis H., to Moldex, Inc. Method and belt of oriented nylon with rubber sheet adhered thereto. 4,056,419, Cl. 156-164.000.
Pako Corporation: *See*—
Baert, Victor R.; and Harvey, Ronald B., 4,056,024, Cl. 83-210.000.
Getsch, Edward W., 4,055,933, Cl. 53-187.000.
Pallos, Ferenc M., to Stauffer Chemical Company. Acylformanidine insecticidal and miticidal compounds. 4,056,570, Cl. 260-562.00B.

Pallos, Ferenc M., to Stauffer Chemical Company. Bis-cycloalkylthiocarbamates as insect control agents. 4,056,627, Cl. 424-300.000.

Palumbo, Luigi: *See*—
Colletta, Angelo; and Palumbo, Luigi, 4,056,443, Cl. 201-5.000.

Panaritis, Dimitrios P.; and Iacovidis, Spyros A., to Panaritis, Georges P.; and Panaritis, Panayotis P. Apparatus for cutting meat. 4,056,026, Cl. 83-454.000.

Panaritis, Georges P.: *See*—
Panaritis, Dimitrios P.; and Iacovidis, Spyros A., 4,056,026, Cl. 83-454.000.

Panaritis, Panayotis P.: *See*—
Panaritis, Dimitrios P.; and Iacovidis, Spyros A., 4,056,026, Cl. 83-454.000.

Pandolfo, Joseph P.: *See*—
Henriques, Frederick C.; Pandolfo, Joseph P.; and Lunde, Peter, 4,056,090, Cl. 126-271.000.

Paper Lynen Co. Ltd., The: *See*—
Brucciani, Richard Louis, 4,055,857, Cl. 2-197.000.

Papoff, Paolo; Morelli, Basilio; and Guidarini, Dante, to Centro Nazionale Delle Richerche. Actuating device with electronic control for injectors of liquid mixers. 4,056,258, Cl. 366-160.000.

Parc, Jean Edmond: *See*—
Michel, Alain Marie; and Parc, Jean Edmond, 4,056,098, Cl. 128-142.00R.

Parent, Guy, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for forming channels using detectors spaced out on a circular base. 4,056,715, Cl. 364-514.000.

Paris, Jean: *See*—
Carpentier, Alain; Leclercq, Xavier; and Paris, Jean, 4,055,861, Cl. 3-1.500.

Parisis, Jean; Rossion, Roger; and Depoitier, Jacques, to Cimenteries C.B.R. Cementbedrijven. Device for measuring slope parameters for a material contained inside a cylinder rotated about the axis thereof. 4,056,349, Cl. 432-36.000.

Parrish, Clyde F.: *See*—
Franklin, Gerald B.; and Parrish, Clyde F., 4,056,416, Cl. 149-19.910.

Partyka, Richard Anthony: *See*—
Buchanan, Ronald Leslie; Partyka, Richard Anthony; and Standridge, Robert Ted, 4,056,540, Cl. 260-340.300.

Pastorino, Ronald L.: *See*—
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., 4,056,561, Cl. 260-46.50G.

Patella, Ralph F.: *See*—
Powanda, Thomas M.; Patella, Ralph F.; Vona, Joseph A.; and DeFazio, Charles A., 4,056,503, Cl. 260-29.60T.

Patsey, John A.: *See*—
Henry, Edwin Blair, Jr.; Patsey, John A.; Rudolph, Ralph G.; and Schindler, Donald G., 4,055,989, Cl. 73-588.000.

Pattas, Konstantin, to Daimler-Benz Aktiengesellschaft. Internal combustion engine. 4,056,081, Cl. 123-75.00B.

Patterson, G. Keith. Apparatus for guiding a portable power-saw. 4,056,028, Cl. 83-745.000.

Patterson, John A.: *See*—
Kolaian, Jack H.; McCoy, Frederic C.; and Patterson, John A., 4,056,355, Cl. 8-137.000.

Pavlovich, Inna Vasilievna: *See*—
Vulikh, Alexandr Ilich; Zagorskaya, Maina Konstantinovna; Kofman, Izrail Zalmanovich; Pavlovich, Inna Vasilievna; Levitan, Boris Veniaminovich; Troyan, Nikolai Vasilievich; and Dubyaga, Sergei Viktorovich, 4,056,605, Cl. 423-484.000.

Pedersen, Mogens Lindskov: *See*—
Hansen, Karl Erik; Hovmand, Svend; Pedersen, Mogens Lindskov; Schwartzbach, Christian; Htun, Myat; de Ruvo, Alf; and Cavlin, Soren, 4,055,903, Cl. 34-12.000.

Penn Fishing Tackle Mfg. Co.: *See*—
Purcell, William, 4,056,246, Cl. 242-219.000.

Pennwalt Corporation: *See*—
Radice, Peter Francis, 4,055,878, Cl. 29-25.350.

PepsiCo Inc.: *See*—
Homanick, George, 4,056,066, Cl. 105-493.000.

Perkin-Elmer Corporation, The: *See*—
Rayces, Juan L., 4,056,307, Cl. 350-181.000.

Perregrino, Anthony: *See*—
Bent, Alfred H.; Booth, George J.; and Perregrino, Anthony, 4,056,353, Cl. 8-14.000.

Perry, Loren Dale. Display and scheduling panels with document holding envelope. 4,055,909, Cl. 40-124.200.

Perry, Louis James, to Invo Spline, Inc. Detection system for machine tools. 4,056,329, Cl. 408-6.000.

Peter Paul Electronics Co., Inc.: *See*—
Allen, Walter E., 4,056,119, Cl. 137-315.000.

Peters, Ann Margaret; Greaves, Geoffrey Stuart; Clark, Ian Robert; Holder, Roger Leonard; and Bunce, Roger Abraham, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Social Services in Her Britannic Majesty's Government of the. Vial or other container, and carrier therefor. 4,056,361, Cl. 23-259.000.

Peters, Hans H., to Resources Conservation Co. Method of dewatering material containing solid matter and bound and unbound water. 4,056,466, Cl. 210-10.000.

Petersen, Egon Norbert: *See*—
Schmidt, Werner; Petersen, Egon Norbert; and Richtzenhain, Hermann, 4,056,508, Cl. 260-45.75B.

Peterson, Frank C.: *See*—
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,056,506, Cl. 260-42.180.

Peterson, William Anders, to Bell Telephone Laboratories, Incorporated. Compensated base drive circuit to regulate saturated transistor current gain. 4,056,734, Cl. 307-254.000.

Petit, Michel: *See*—
Debrie, Guy; Grenier, Claude; Petit, Michel; Rigaut, Henri; and Vertut, Jean, 4,056,763, Cl. 318-675.000.

Petro-Tex Chemical Corporation: *See*—
Kerr, Ralph O., 4,056,487, Cl. 252-435.000.
Manning, Harold E., 4,056,490, Cl. 252-468.000.

Petrolite Corporation: *See*—
Redmore, Derek; and Welge, Frederick T., 4,056,479, Cl. 252-18.000.

Pettingell, James R.; and Armstrong, Lee R., to United Technologies Corporation. Waveform count of teeth on an internal combustion engine flywheel. 4,055,998, Cl. 73-119.00R.

Petty, Jon; Trott, Beverly D.; and Backofen, Joseph E., to United States of America, Army. Portable pressure vessel and closure. 4,056,212, Cl. 220-244.000.

Peytavin, Pierre, to Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies). Turning mechanism for the movement of ladles in steel mills. 4,056,197, Cl. 214-1.0BC.

Phillips, David C.: *See*—
Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., 4,056,005, Cl. 73-339.00R.
Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., 4,056,006, Cl. 73-339.00R.

Phillips Petroleum Company: *See*—
Carrow, Guy E., 4,056,594, Cl. 264-176.00R.
Cobb, Raymond L., 4,056,542, Cl. 260-346.300.
Cooper, Earl D., 4,056,597, Cl. 264-169.000.
Hutson, Thomas, Jr.; and Makovec, Donald J., 4,056,577, Cl. 260-683.480.
Kenton, Joseph R., 4,056,381, Cl. 71-36.000.
Vidaurri, Fernando C., Jr., 4,056,515, Cl. 260-79.100.

Phillips, Raymond M. Mattress having an internal fluid containing chamber. 4,055,867, Cl. 5-371.000.

Phillips, Wendell C., Jr.: *See*—
Reid, Alan; and Phillips, Wendell C., Jr., 4,056,079, Cl. 122-476.000.

Phillips, William, to RCA Corporation. Light modulation employing single crystal optical waveguides of niobium-doped lithium tantalate. 4,056,304, Cl. 350-96.0WG.

Phoenix Products Company, Inc.: *See*—
Faux, Kenneth R., Sr.; and Wenman, William A., 4,056,718, Cl. 362-306.000.

Piessey Handel und Investments A.G.: *See*—
Whitfield, John Alan; and Burdis, Eric William, 4,056,804, Cl. 340-146.30J.

Pike, Roscoe A.: *See*—
Galasso, Francis S.; Bourdeau, Romeo G.; and Pike, Roscoe A., 4,056,598, Cl. 264-184.000.

Piltz, Lars-Erik; and Tvingstedt, Claes, to AB Akerlund & Rausing. Laminated package. 4,056,221, Cl. 229-14.0BL.

Pioli, Alexander Joseph Peter: *See*—
Ballard, Denis George Harold; Jones, Eric; Padget, John Christopher; Pioli, Alexander Joseph Peter; Robinson, Peter Anthony; Walker, John; and Wyatt, Ronald John, 4,056,669, Cl. 526-154.000.

Pioneer Electronic Corporation: *See*—
Okamoto, Kintaro; Kudo, Hirokatu; Ishijimi, Soichi; Kadoiri, Etsuro; Soma, Hiroshi; and Suzuki, Hiroyuki, 4,056,165, Cl. 181-141.000.

Pittman, Allen G.; Wasley, William L.; and Getchell, Nelson F., to United States of America, Agriculture. Process for rapid dyeing of textiles. 4,056,354, Cl. 8-54.000.

Pittsburgh Corning Corporation: *See*—
Kirkpatrick, John; and Kijowski, John, 4,056,399, Cl. 106-69.000.

Pizzarello, Frank A., to Rockwell International Corporation. Beam lead testing apparatus. 4,055,992, Cl. 73-88.00B.

Place, Harry, to International Telephone and Telegraph Corporation. Digital tone generator. 4,056,692, Cl. 179-84.0VF.

Platt Saco Lowell Limited: *See*—
Clayton, James William Barnes, 4,055,938, Cl. 57-58.890.

Plessey Company Limited, The: *See*—
Martin, Barrie James, 4,056,143, Cl. 165-176.000.

Plessey Handel und Investments A.G.: *See*—
Blatt, Victor, 4,056,736, Cl. 307-289.000.

Pochan, John M.: *See*—
Turner, Sam R.; and Pochan, John M., 4,056,391, Cl. 96-1.0PC.

Pockrandt, Gunter: *See*—
Baron, Gerhard; Bierbach, Herbert; Hafke, Carl; and Pockrandt, Gunter, 4,056,483, Cl. 252-373.000.

Podzharsky, Avrum Iosifovich: *See*—
Skvortsov, Gennady Alexeevich; Nizeeva, Nellya Nikitichna; Podzharsky, Avrum Iosifovich; and Dobrovolskaya, Irma Viktorovna, 4,056,600, Cl. 423-239.000.

Pohto, Gerald R.; Kubrin, Michael J.; and Sutter, Robert C., to Diamond Shamrock Corporation. Monopolar membrane electrolytic cell. 4,056,458, Cl. 204-263.000.

Polaroid Corporation: *See*—
Greenwald, Richard B., 4,056,539, Cl. 260-326.14R.
Scott, Kenneth G., 4,056,392, Cl. 96-3.000.

Policardi, Silvio: *See*—
Ritti, Stelio; and Policardi, Silvio, 4,056,459, Cl. 204-286.000.

Pollitt, Duncan H.; and Reich, Murray H., to Princeton Chemical Research, Inc. Homogeneous molded golf ball. 4,056,269, Cl. 273-218.000.

Pollock, Douglas; Sobarzo, Omar; Urquizar, Rolando; Vilches, Carlos; and Bolanos, Jaime, to Compania de Acero del Pacifico S.A. Cupola furnace to enable continuous smelting and refining of cement copper and method therefor. 4,056,262, Cl. 266-138.000.

Pond, George R.: *See*—
Hindin, Saul G.; and Pond, George R., 4,056,489, Cl. 252-462.000.

Ponticello, Ignazio Salvatore, to Eastman Kodak Company. Process of preparing substituted acrylates. 4,056,543, Cl. 260-348.590.

Popovich, John Michael: *See*—
Meier, Harold K.; and Popovich, John Michael, 4,056,092, Cl. 126-271.000.

Pospischil, Reginhard; and Domer, Josef, to Siemens Aktiengesellschaft. Transmission system for pulse signals. 4,056,790, Cl. 333-5.000.

Possell, Clarence R.: *See*—
Winkler, Robert J.; and Possell, Clarence R., 4,056,209, Cl. 215-215.000.

Pow, Robert Marvin, to King Seagrave Limited. Truck construction. 4,056,283, Cl. 298-17.600.

Powanda, Thomas M.; Patella, Ralph F.; Vona, Joseph A.; and DeFazio, Charles A., to Celanese Corporation. Incorporation of multifunctional monomers (PETA, TMPTA, and HDODA) in vinyl-acrylic emulsion polymers. 4,056,503, Cl. 260-29.60T.

PPG Industries, Inc.: *See*—
Kelly, Joseph B.; and Gibson, Kenneth A., 4,056,379, Cl. 65-106.000.
Nielsen, Donald R., 4,056,491, Cl. 252-557.000.
Rinehart, Jay Kent, 4,056,549, Cl. 260-455.00A.

Pratt, Jeff D.: *See*—
Day, Leon E., 4,056,214, Cl. 222-608.000.

Precise Corporation: *See*—
York, Richard N.; and York, David L., 4,056,427, Cl. 156-580.000.

Precision Monolithics, Inc.: *See*—
Schoeff, John A., 4,056,740, Cl. 307-362.000.

Prejean, George Wyatt. Caustic-resistant polymer coatings for glass. 4,056,208, Cl. 215-12.00R.

Presto Products Incorporated: *See*—
Schwarz, Eckhard C. A., 4,056,639, Cl. 426-264.000.

Prestridge, Floyd L., to Combustion Engineering, Inc. Panel board. 4,056,733, Cl. 307-115.000.

Priarone, Paolo; and Achter, Eugene K., to Baxter Travenol Laboratories, Inc. Apparatus for deriving blood oxygen association curve information. 4,056,358, Cl. 23-253.00R.

Princeton Chemical Research, Inc.: *See*—
Pollitt, Duncan H.; and Reich, Murray H., 4,056,269, Cl. 273-218.000.

Princeton Gamma-Tech, Inc.: *See*—
Harchol, Micha, 4,056,726, Cl. 250-370.000.

Prinz, Richard: *See*—
Alberts, Heinrich; Bartl, Herbert; and Prinz, Richard, 4,056,671, Cl. 526-342.000.

Procor Limited: *See*—
Deeks, Ronald George, 4,056,117, Cl. 137-68.00R.

Procter & Gamble Company, The: *See*—
Johnson, Eric M.; Murray, Graeme D.; and Hardy, Frederick E., 4,056,113, Cl. 134-40.000.
Tate, John Robert, 4,056,481, Cl. 252-140.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Arsac, Aime Joseph; and Frank, Pierre, 4,056,367, Cl. 44-59.000.

Professional Positioners, Inc.: *See*—
Huge, Gerald W., 4,055,895, Cl. 32-14.00B.

Propp, Donald J.: *See*—
Hoerz, Richard D.; and Propp, Donald J., 4,056,741, Cl. 310-322.900.

Provost, Richard H., to Package Machinery Company. High speed stacker. 4,056,200, Cl. 214-7.000.

Pruzan, Philippe: *See*—
Ter-Minassian, Leon; Pruzan, Philippe; Figuiere, Pierre; and Szwarc, Henri, 4,055,982, Cl. 73-15.00B.

Pryor, Michael J.; and Gray, Thomas J., to Swiss Aluminium Limited. Method of preparing molten metal filter. 4,056,586, Cl. 264-44.000.

Pugnet, Lucien: *See*—
Gama, Jean-Michel; Lallement, Jean; and Pugnet, Lucien, 4,056,438, Cl. 176-50.000.

Purcell, William, to Penn Fishing Tackle Mfg. Co. Fishing reel with friction drag. 4,056,246, Cl. 242-219.000.

Purolator, Inc.: *See*—
Mouwen, Herman Charles; Lauer, William; and Weinberg, Steven Louis, 4,056,476, Cl. 210-446.000.

Puschel, Siegfried: *See*—
Abels, Theodor; and Puschel, Siegfried, 4,056,160, Cl. 180-143.000.

Pye, Earl L.: *See*—
Gauntt, Wayne M.; and Pye, Earl L., 4,056,445, Cl. 204-1.00T.

Quackenbush, Henry. Method of and apparatus for the recovery of a desired material from a carrier stream. 4,056,369, Cl. 55-58.000.

Quinn, Robert J., to Digital Equipment Corporation. Display processing unit for drawing vectors. 4,056,713, Cl. 364-521.000.

Quintron, Inc.: *See*—
Jacoby, Benjamin Franklin; and Monroe, Marvin E., 4,056,761, Cl. 318-116.000.

R. A. Jones & Co. Inc.: *See*—
Hughes, Charles C., 4,056,046, Cl. 93-49.00R.

R. Alkan & Cie: *See*—
Hasquenoph, Jean H.; and Coutin, Pierre Fernand, 4,056,248, Cl. 244-137.00R.

R. J. Reynolds Tobacco Company: *See*—
Schumacher, Joseph N.; Best, Freddie W.; and Green, Charles R., 4,056,108, Cl. 131-17.00R.

Raasch, Hans, to W. Schlafhorst & Co. Method for terminating a spinning operation. 4,055,936, Cl. 57-34.00R.

Rabelos, Nicholas A., to Clark, Thomas G.; Clary, Kenneth B.; England, J. Melvin; O'Brien, Charles, Jr.; and Rabelos, Nicholas A. Detachable fire escape device. 4,056,166, Cl. 182-5.000.

Rabon, James L., to United States of America, Navy. Sonar alarm system. 4,056,802, Cl. 340-3.00R.

Rackliffe, Richard J.; and Armstrong, Lee R., to United Technologies Corporation. Sub-cyclic measurement of speed of an internal combustion engine. 4,055,993, Cl. 73-116.000.

Radek, John R., to Ready Metal Manufacturing Company. Combination service truck and dispensing equipment. 4,056,194, Cl. 211-131.000.

Radice, Peter Francis, to Pennwalt Corporation. Stabilization of piezoelectric resin elements. 4,055,878, Cl. 29-25.350.

Ragone, Alexander C.; and Ragone, Inez. Hospital gown. 4,055,855, Cl. 2-114.000.

Ragone, Inez: *See*—
Ragone, Alexander C.; and Ragone, Inez, 4,055,855, Cl. 2-114.000.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Hindered piperidine carboxylic acids, metal salts thereof and stabilized compositions. 4,056,507, Cl. 260-45.80N.

Rampel, Guy G.; and Young, Jon R., to General Electric Company. Rechargeable cell with oxygen sensing electrode. 4,056,660, Cl. 429-59.000.

Randazzo, Gaspare, to Societa di Elettronica per l'Automazione - SEPA S.p.A. Digital tachometer. 4,056,778, Cl. 324-166.000.

Rath, Hans M. Dual purpose semi-automatic convertible rifle. 4,056,038, Cl. 89-128.000.

Ratliff, David P. Throttle valve lock for automobile. 4,056,089, Cl. 123-198.00B.

Ratti, Renald Anthony: *See*—
Dworak, Francis Stanislaus; and Ratti, Renald Anthony, 4,056,698, Cl. 179-175.20C.

Rauterkus, Karl Josef: *See*—
Reinecke, Rolf; Rauterkus, Karl Josef; Schmieder, Werner; and Lutz, Eleonore, 4,056,497, Cl. 260-29.6TA.

Ravas, Richard J., to Westinghouse Electric Corporation. Pulse generator. 4,056,105, Cl. 128-419.0PG.

Ravi, Kramadhati Venkata: *See*—
Garone, Lynne C.; and Ravi, Kramadhati Venkata, 4,056,404, Cl. 136-89.0PC.

Ravier, Jean: *See*—
Giacometti, Christian; Mougniot, Jean-Claude; and Ravier, Jean, 4,056,437, Cl. 176-40.000.

Ravitts, Richard B., to Riga, Inc. Separating apparatus for clarifying liquid. 4,056,477, Cl. 210-522.000.

Ray, Earnest Joseph, to Dictaphone Corporation. Shaft position sensor. 4,056,722, Cl. 250-231.0SE.

Ray, Eric Thomas, to AMF Incorporated. Knife growth detector. 4,056,022, Cl. 83-62.000.

Rayces, Juan L., to Perkin-Elmer Corporation, The. Anamorphic scanner lens system. 4,056,307, Cl. 350-181.000.

Raymond, Maurice A.: *See*—
Cramer, Robert J.; and Raymond, Maurice A., 4,056,403, Cl. 134-22.00R.

Raytheon Company: *See*—
Derby, Palmer P., 4,056,756, Cl. 315-39.690.
Dionne, Norman J.; and Wettstein, Ernest C., 4,056,800, Cl. 335-296.000.

RCA Corporation: *See*—
Hovagimyan, Norman; and Link, John Michael, 4,056,851, Cl. 364-900.000.
Marcantonio, Angelo Robert, 4,056,847, Cl. 364-200.000.
Phillips, William, 4,056,304, Cl. 350-96.0WG.
Sohn, Frank Myung-Hi, 4,056,755, Cl. 313-402.000.
Vossen, John Louis, Jr., 4,056,457, Cl. 204-192.0SP.

Read, Donald B.: *See*—
McCauslan, George L.; and Read, Donald B., 4,056,450, Cl. 204-201.000.

Ready Metal Manufacturing Company: *See*—
Radek, John R., 4,056,194, Cl. 211-131.000.

Reb Manufacturing Inc.: *See*—
Meldahl, Robert D.; and Smalley, Raymond L., 4,056,203, Cl. 214-75.00T.

Rechter, Harold L.; and Haligarda, James R., to Chicago Fire Brick Company. Plastic refractory composition suitable for placement by vibrating and the use thereof. 4,056,398, Cl. 106-65.000.

Redifon Limited: *See*—
Spooner, Archer Michael; and Murray, Paul Michael, 4,056,827, Cl. 358-87.000.

Redmore, Derek; and Welge, Frederick T., to Petrolite Corporation. Magnesium carboxylate-sulfonate complexes. 4,056,479, Cl. 252-18.000.

Reed, Hugh Wilma Boulton: *See*—
Holland, David; Milner, David John; and Reed, Hugh Wilma Boulton, 4,056,574, Cl. 260-654.00R.

Refojo, Miguel F.: *See*—
Mancini, William L.; Korb, Donald R.; and Refojo, Miguel F., 4,056,496, Cl. 260-29.6TA.

Reich, Murray H.: *See*—
Pollitt, Duncan H.; and Reich, Murray H., 4,056,269, Cl. 273-218.000.
Reichert, Donald G., to ABC Packaging Machine Corporation. Bottle loading machine. 4,055,943, Cl. 53-247.000.
Reid, Alan; and Phillips, Wendell C., Jr., to United States of America, Navy. Apparatus and process for preheating main boiler superheater headers. 4,056,079, Cl. 122-476.000.
Reimann, Hans; Jaret, Robert S.; and Nafissi-Varchei, Mohammad Mehdi, to Schering Corporation. Rosamicin derivatives and method of using same. 4,056,616, Cl. 424-180.000.
Reinecke, Rolf; Rauterkus, Karl Josef; Schmieder, Werner; and Lutz, Eleonore, to Hoechst Aktiengesellschaft. Acrylic ester copolymers capable of being cross-linked. 4,056,497, Cl. 260-29.6TA.
Reinhard, John D.: *See*—
Gensike, Karl H.; Marsh, Robert C.; and Reinhard, John D., 4,056,321, Cl. 355-99.000.
Reinhart, Thomas L.: *See*—
Daus, John J., Jr.; James, Henry E.; and Reinhart, Thomas L., 4,056,327, Cl. 403-172.000.
Reiss, Gerhard: *See*—
Heinze, Gerhard; Mengel, Manfred; and Reiss, Gerhard, 4,056,370, Cl. 55-68.000.
Reliable Electric Company: *See*—
Lundsgaard, Paul S.; and Sedlacek, William S., 4,056,840, Cl. 361-124.000.
Reliance Electric Company: *See*—
Chung, Jackson, 4,056,018, Cl. 74-665.00P.
Remzhin, Jury Nikolaevich: *See*—
Bukrinsky, Anatoly Matveevich; Matskevich, Genrikh Vladimirovich; Rzheznikov, Julian Vulfovich; Sukhov, Andrei Borisovich; Tatarnikov, Viktor Petrovich; Berkovich, Viktor Mozesovich; Remzhin, Jury Nikolaevich; Slepnev, Lev Nikolaevich; Sverdlov, Alexandr Anatolievich; Karan, Vladimir Geselevich; Kaloshin, Jury Petrovich; Krasikov, Anatoly Nikolaevich; Babenko, Evgeny Akimovich; Bronnikov, Vladimir Konstantinovich; Shvyryaev, Jury Vasilievich; and Shiryaev, Boris Semenovich, 4,056,436, Cl. 176-38.000.
Renz, Mical C.: *See*—
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,056,506, Cl. 260-42.180.
Reparaz, Jose M. Palacios: *See*—
Cantera, Gregorio Asua; Reparaz, Jose M. Palacios; and Molnar, Louis, 4,056,387, Cl. 75-123.00F.
Repay, Laszlo N.; and Young, Thomas A., to Tenna Corporation. Adjustable mirror support. 4,056,253, Cl. 248-479.000.
Repla International S.A.H.: *See*—
de Navas Albareda, Jose Luis, 4,056,593, Cl. 264-145.000.
Research Corporation: *See*—
Sonenberg, Martin; and Yamasaki, Nobuyuki, 4,056,520, Cl. 260-112.50R.
Resource Systems, Inc.: *See*—
Rubin, Leonard Roy, 4,056,373, Cl. 55-158.000.
Resources Conservation Co.: *See*—
Peters, Hans H., 4,056,466, Cl. 210-10.000.
Rexnord, Inc.: *See*—
Fredericks, Walter A., 4,055,966, Cl. 64-13.000.
Rey, Pierre Theodore Joseph; Leandri, Jacqueline Agathe Marie; and Abbou, Clement Claude, to Agence Nationale de Valorisation de la Recherche (ANVAR). Control device for medical and surgical uses. 4,056,095, Cl. 128-1.00R.
Rheinische Braunkohlenwerke AG: *See*—
Behr, Friedrich F., 4,056,607, Cl. 423-579.000.
Rhone-Poulenc Industries: *See*—
Carpentier, Alain; Leclercq, Xavier; and Paris, Jean, 4,055,861, Cl. 3-1.500.
Rhone-Poulenc S.A.: *See*—
Christen, Gilbert; Favre, Bernard; Marze, Xavier; Salmon, Michel; and Thuillier, Rene, 4,056,467, Cl. 210-23.00F.
Ricci, Roberto: *See*—
Aliprandi, Giovanni; and Ricci, Roberto, 4,056,217, Cl. 222-600.000.
Richard, Gerard Y., to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C. Process and apparatus for the continuous preparation of a mixture for foundry molds or the like, with formation of a premix. 4,056,259, Cl. 366-15.000.
Richards, William: *See*—
Grolman, Bernard; and Richards, William, 4,055,900, Cl. 33-200.000.
Richardson, Anthony George, to Denbyware Limited. Transfers. 4,056,648, Cl. 428-138.000.
Richter, Johan C. F. C.; Christenson, Per Tyke; and Richter, Ole Johan, to Kamyr Aktiebolag. Method for counter-current treatment of cellulose fiber material. 4,056,429, Cl. 162-17.000.
Richter, Ole Johan: *See*—
Richter, Johan C. F. C.; Christenson, Per Tyke; and Richter, Ole Johan, 4,056,429, Cl. 162-17.000.
Richtzenhain, Hermann: *See*—
Riegger, Paul; Richtzenhain, Hermann; and Zoche, Gunter, 4,056,454, Cl. 204-163.00R.
Schmidt, Werner; Petersen, Egon Norbert; and Richtzenhain, Hermann, 4,056,508, Cl. 260-45.75B.
Ricoh Company, Ltd.: *See*—
Ariyama, Kenzo; Ota, Sakae; Ikeda, Sunao; and Okamoto, Toyoo, 4,056,315, Cl. 355-10.000.
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; and Takahashi, Michihisa, 4,056,824, Cl. 354-300.000.
Mochimaru, Hideaki; and Kobayashi, Yugoro, 4,056,320, Cl. 355-75.000.
Riegger, Paul; Richtzenhain, Hermann; and Zoche, Gunter, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of α,α,αα',α'-pentachloro-o-xylene. 4,056,454, Cl. 204-163.00R.
Riga, Inc.: *See*—
Ravitts, Richard B., 4,056,477, Cl. 210-522.000.
Rigaut, Henri: *See*—
Debrie, Guy; Grenier, Claude; Petit, Michel; Rigaut, Henri; and Vertut, Jean, 4,056,763, Cl. 318-675.000.
Rinehart, Jay Kent, to PPG Industries, Inc. S-3-Methoxyphenyl N-alkylthiolcarbamates and S-3-methylthiophenyl N-alkylthiolcarbamates. 4,056,549, Cl. 260-455.00A.
Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, to Carl Freudenberg, Firma. Gas filter element. 4,056,375, Cl. 55-381.000.
Risbourg, Bernard: *See*—
Carlier, Jacques; and Risbourg, Bernard, 4,056,435, Cl. 176-30.000.
Risch, Gerhard M. Apparatus for dilution of liquid specimens. 4,056,360, Cl. 23-259.000.
Risdon Manufacturing Company, The: *See*—
Kotuby, Paul M., 4,056,216, Cl. 222-385.000.
Ritchie, James A., to Caterpillar Tractor Co. Apex seals for slant axis rotary mechanisms. 4,056,336, Cl. 418-51.000.
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Schumacher, Joseph N.; Best, Freddie W.; and Green, Charles R., to R. J. Reynolds Tobacco Company. Tobacco product. 4,056,108, Cl. 131-17.00R.
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Serfozo, Tibor; and Simenz, Rod F., to Lockheed Aircraft Corporation. Precision forging of titanium. 4,055,975, Cl. 72-42.000.
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Shaw Pipe Industries Ltd.: *See*—
Jarvis, Harold F., 4,056,421, Cl. 156-272.000.
Shaw, Stuart Walter Ker Sutton, to International Nickel Company, Inc., The. Nickel-chromium high strength casting. 4,056,389, Cl. 75-171.000.
Sheffield, Byford D.: *See*—
Symm, Richard H.; and Sheffield, Byford D., 4,056,510, Cl. 260-47.0EP.
Shell Oil Company: *See*—
Aspin, Frank M., 4,056,418, Cl. 156-145.000.
Leach, Ronald W. A., 4,056,385, Cl. 71-111.000.
McClure, James D.; and Brandenberger, Stanley G., 4,056,578, Cl. 260-683.470.
Stewart, Thomas L.; and Cadena, Edward R., 4,055,986, Cl. 73-61.00R.
Verbrugge, Pieter A.; and Uurbanus, Elisabeth W., 4,056,509, Cl. 260-465.00G.
Shepardson, Robert C.; and Watts, Michael E., to Coherent Radiation. System for decoding bar code. 4,056,710, Cl. 235-437.000.
Shephard, Margaret Claire: *See*—
Bowie, Raymond Alexander; Cox, John Michael; Farrell, Gordon Michael; and Shephard, Margaret Claire, 4,056,384, Cl. 71-92.000.
Sherwood, Richard Curry: *See*—
Chen, Ho Sou; Gyorgy, Ernst Michael; Leamy, Harry John; and Sherwood, Richard Curry, 4,056,411, Cl. 148-121.000.
Shimano, Masanao: *See*—
Harada, Nobuhiko; Tanaka, Minetaka; Shimano, Masanao; Fujinaga, Kyozo; Nunomura, Kunito; Tamura, Masamitu; Nakamura, Shigeharu; and Akagi, Kazuo, 4,056,428, Cl. 156-642.000.
Shimizu, Akihiko: *See*—
Seita, Toru; Shimizu, Akihiko; and Kosaka, Yujiro, 4,056,666, Cl. 526-29.000.
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Shinagawa, Mitsuhisa: *See*—
Saitoh, Takeshi; Akutsu, Eisaku; and Shinagawa, Mitsuhisa, 4,056,787, Cl. 331-59.000.
Shinoda, Kazuo; and Ii, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha. Variable venturi carburetor. 4,056,583, Cl. 261-36.00A.
Shipov, Emmanuil Ivanovich: *See*—
Volfkovich, Semen Issakovich; Belov, Vladimir Nikolaevich; Ershov, Vadim Andreevich; Rozenberg, Evgeny Khaskelevich; Shipov, Emmanuil Ivanovich; and Jumanova, Ljudmila Vladimirovna, 4,056,601, Cl. 423-322.000.
Shipway, Richard Edward: *See*—
Baxter, Duane Willard; and Shipway, Richard Edward, 4,056,716, Cl. 364-515.000.
Shirato, Toru: *See*—
Izumi, Ryoji; Kobayashi, Shoji; Ono, Toshiharu; Shirato, Toru; Fujii, Akiyoshi; and Okihara, Tadashi, 4,056,592, Cl. 264-141.000.
Shiryaev, Boris Semenovich: *See*—
Bukrinsky, Anatoly Matveevich; Matskevich, Genrikh Vladimirovich; Rzheznikov, Julian Vulfovich; Sukhov, Andrei Borisovich; Tatarnikov, Viktor Petrovich; Berkovich, Viktor Mozesovich; Remzhin, Jury Nikolaevich; Slepnev, Lev Nikolaevich; Sverdlov, Alexandr Anatolievich; Karan, Vladimir Geselevich; Kaloshin, Jury Petrovich; Krasikov, Anatoly Nikolaevich; Babenko, Evgeny Akimovich; Bronnikov, Vladimir Konstantinovich; Shvyryaev, Jury Vasilievich; and Shiryaev, Boris Semenovich, 4,056,436, Cl. 176-38.000.
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Sholter, Joseph R.: *See*—
Green, Charles B.; and Sholter, Joseph R., 4,055,859, Cl. 2-243.00R.
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Baniel, Avraham Matitiahu; Mitzmager, Abraham; Segall, Jeanna; Star, Shlomo; and Shorr, Leonard Marshall, 4,056,588, Cl. 264-63.000.
Showa Denko K.K.: *See*—
Kitaoka, Shigeo; Johkoh, Katsuhiro; Ebisawa, Hisashi; Sato, Tadashi; Kubo, Hiroshi; Takahashi, Sosuke; and Kawase, Yoshinobu, 4,056,631, Cl. 424-330.000.
Showa Electric Wire & Cable Co., Ltd.: *See*—
Aihara, Mitsugu; Kogane, Yutaka; Ebinuma, Yasumitsu; and Minami, Masaki, 4,056,680, Cl. 174-19.000.
Showalter, John Melville, to United Technologies Corporation. Elevator control system. 4,056,169, Cl. 187-29.00R.
Shum, Lanson Y., to Westinghouse Electric Corporation. Electronic watthour meter circuit. 4,056,774, Cl. 324-142.000.
Shvyryaev, Jury Vasilievich: *See*—
Bukrinsky, Anatoly Matveevich; Matskevich, Genrikh Vladimirovich; Rzheznikov, Julian Vulfovich; Sukhov, Andrei Borisovich; Tatarnikov, Viktor Petrovich; Berkovich, Viktor Mozesovich; Remzhin, Jury Nikolaevich; Slepnev, Lev Nikolaevich; Sverdlov, Alexandr Anatolievich; Karan, Vladimir Geselevich; Kaloshin, Jury Petrovich; Krasikov, Anatoly Nikolaevich; Babenko, Evgeny Akimovich; Bronnikov, Vladimir Konstantinovich; Shvyryaev, Jury Vasilievich; and Shiryaev, Boris Semenovich, 4,056,436, Cl. 176-38.000.
Sieber, Axel: *See*—
Heimburger, Norbert; Sieber, Axel; and Schwinn, Horst, 4,056,484, Cl. 252-408.000.
Siemens Aktiengesellschaft: *See*—
Auracher, Franz, 4,056,377, Cl. 65-4.00A.
Bauer, Johann, 4,056,799, Cl. 335-277.000.
Hofer, Ernst, 4,056,820, Cl. 340-347.00C.
Lohmann, Reiner; and Ludwig, Volker, 4,056,791, Cl. 333-18.000.
Lukas, Eberhard, 4,056,819, Cl. 340-347.0DD.
Pospischil, Reginhard; and Domer, Josef, 4,056,790, Cl. 333-5.000.
Zander, Hans-Hermann, 4,056,766, Cl. 63-37.000.
Sienicki, John W.; and Haycox, Clarence A., to Erie Technological Products, Inc. Ceramic trimmer capacitor. 4,056,842, Cl. 361-293.000.
Sievert, William C.: *See*—
Leckie, Harry P.; Sievert, William C.; and Legault, Robert A., 4,056,657, Cl. 428-659.000.
Silverberg, Morton, to Xerox Corporation. Liquid ink imaging system. 4,056,314, Cl. 355-10.000.
Silvis, Richard R.; and Ettinger, John A., to Textron Inc. Apparatus and method of positioning sliders. 4,056,184, Cl. 198-471.000.
Simanovsky, Leonid Mikhailovich: *See*—
Markman, Mikhail Abramovich; Simanovsky, Leonid Mikhailovich; Jurkevich, Igor Rostislavovich; Kolomoets, Nikolai Vasilievich; Kamensky, Vyacheslav Tikhonovich; Matskov, Igor Mikhailovich; and Maximov, Sergei Ilich, 4,056,406, Cl. 136-208.000.
Simenz, Rod F.: *See*—
Serfozo, Tibor; and Simenz, Rod F., 4,055,975, Cl. 72-42.000.
Simon, Hans. Strain-relief bushing for cables and the like. 4,056,252, Cl. 248-56.000.
Sims, Robert Dennis, to Western Electric Company. Decoupling control arrangement for auxiliary circuits coupled to telephone lines. 4,056,687, Cl. 179-16.00F.
Sindelar, John B. Mechanical toy. 4,055,913, Cl. 46-143.000.
Singer Company, The: *See*—
Adams, Kenneth Douglas, 4,056,071, Cl. 112-237.000.
Cornforth, Malcolm W., 4,056,717, Cl. 364-510.000.
Hauf, Robert Conrad, 4,056,070, Cl. 112-158.00B.
Sinkovitz, Gloria DiMarco: *See*—
Slagel, Robert Clayton; and Sinkovitz, Gloria DiMarco, 4,056,432, Cl. 162-168.0NA.
Sipin, Richard F., to American Tara Corporation. Paper salvaging machine with improved splicing board. 4,056,426, Cl. 156-505.000.
Sisin, Mikhail Fedorovich: *See*—
Boyadzhian, Varazdat Karapetovich; Khachatrian, Saribek Saakovich; Stepanian, Genrikh Gevorkovich; Eritsian, Volodya Karapetovich; Agavelian, Edik Stepanovich; Nefedov, Oleg Matveevich; Dolgy, Igor Evgenievich; Sisin, Mikhail Fedorovich; Kolbasin, Alexei Yakovlevich; and Anikeev, Ivan Konstantinovich, 4,056,563, Cl. 560-245.000.
Skinner, Frank R., II: *See*—
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Skok, Jean: *See*—
Marmonier, Pierre; Mesnage, Bernard; Skok, Jean; and Vayra, Jean, 4,056,441, Cl. 176-78.000.
Skoultchi, Martin M., to National Starch and Chemical Corporation. Anaerobic adhesive and sealant compositions employing as a catalyst α-amino sulfone compound. 4,056,670, Cl. 526-320.000.
Skvortsov, Gennady Alexeevich; Nizeeva, Nellya Nikitichna; Podzharsky, Avrum Iosifovich; and Dobrovolskaya, Irma Viktorovna. Method of selective catalytic purification of waste gases from nitrogen oxides. 4,056,600, Cl. 423-239.000.
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Slepnev, Lev Nikolaevich: *See*—
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Slob, Arie: *See*—
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Smalley, Raymond L.: *See*—
Meldahl, Robert D.; and Smalley, Raymond L., 4,056,203, Cl. 214-75.00T.
Smith, DeWitt Paul: *See*—
Freimanis, Laimons; Mussman, Harry Edward; and Smith, DeWitt Paul, 4,056,691, Cl. 179-18.0FA.
Smith, Douglas A., to Burroughs Corporation. Utilizing data for transducer positioning. 4,056,830, Cl. 360-51.000.
Smith, Earl R., to Livermore and Knight Co., Inc. Vacuum printing cylinder construction. 4,056,057, Cl. 101-382.0MV.
Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., to Westinghouse Electric Corporation. Blocked isocyanate composition for forming T hermoparticulating coating. 4,056,005, Cl. 73-339.00R.
Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., to Westinghouse Electric Corporation. Metal dithiocarbamate composition for forming thermoparticulating coating. 4,056,006, Cl. 73-339.00R.

Smith Kline & French Laboratories Limited: *See—*
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,056,621, Cl. 424-273.00R.
White, George Raymond, 4,056,620, Cl. 424-270.000.

Smith, Richard E., to Xerox Corporation. Developer mixing system. 4,056.076, Cl. 118-653.000.

Smithwick, Edward L., Jr.: *See—*
Bobbitt, Jesse L.; and Smithwick, Edward L., Jr., 4,056,519, Cl. 260-112.50R.

SNAC S.p.A. Refrattari Argille e Caolini: *See—*
Aliprandi, Giovanni; and Ricci, Roberto, 4,056,217, Cl. 222-600.000.

Snee, David J.: *See—*
Bevington, Richard C.; and Snee, David J., 4,056,365, Cl. 428-565.000.

Snouffer, William N. Straining valves. 4,056,474, Cl. 210-390.000.

Snyder, Lloyd L.; and Furda, Jana, to Technicon Instruments Corporation. Direct bilirubin assay. 4,056,357, Cl. 23-230.00B.

Snyder, W. Henry, to Snyder, W. Henry. Bicycle transmissions. 4,056,013, Cl. 74-217.00B.

Sobajima, Katsunobu: *See—*
Imabuchi, Yoshihisa; Kurami, Kenshi; Akiyama, Yoshinori; and Sobajima, Katsunobu, 4,056,271, Cl. 280-745.000.

Sobarzo, Omar: *See—*
Pollock, Douglas; Sobarzo, Omar; Urquizar, Rolando; Vilches, Carlos; and Bolanos, Jaime, 4,056,262, Cl. 266-138.000.

Societa di Elettronica per l'Automazione - SEPA S.p.A.: *See—*
Randazzo, Gaspare, 4,056,778, Cl. 324-166.000.

Societa Farmaceutici Italia S.p.A.: *See—*
Bertazzoli, Cesare; Sala, Luisa; and Ghione, Mario, 4,056,613, Cl. 424-94.000.

Societe Anonyme dite: BORACIER: *See—*
Fagniart, Gaston, 4,056,138, Cl. 150-.500.

S.A. Echevarria: *See—*
Cantera, Gregorio Asua; Reparaz, Jose M. Palacios; and Molnar, Louis, 4,056,387, Cl. 75-123.00F.

Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C.: *See—*
Richard, Gerard Y., 4,056,259, Cl. 366-15.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Boudigues, Serge, 4,055,949, Cl. 60-269.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Bonafos, Raymond, 4,056,167, Cl. 182-10.000.

Society Messier: *See—*
Girard, Edmond, 4,055,965, Cl. 62-324.000.

Sohn, Frank Myung-Hi, to RCA Corporation. Color picture tube having mask-frame assembly with reduced thickness. 4,056,755, Cl. 313-402.000.

Sohn, Wolfgang: *See—*
Moinr, Adolf; Sohn, Wolfgang; and Strobl, Georg, 4,056,770, Cl. 324-205.000.

Soikkanen, Pertti: *See—*
Koponen, Martti; and Soikkanen, Pertti, 4,056,433, Cl. 162-290.000.

Sola Basic Industries, Inc.: *See—*
Beall, Benjamin S., III; and Novy, Russell F., 4,056,678, Cl. 13-25.000.

Solarex Corporation: *See—*
Varadi, Peter F., 4,056,405, Cl. 136-89.0PC.

Solvay & Cie: *See—*
Berger, Eugene; Gerard, Pol; Delbouille, Andre; and Deroitte, Jean-Louis, 4,056,668, Cl. 526-124.000.
Ritti, Stelio; and Policardi, Silvio, 4,056,459, Cl. 204-286.000.

Soma, Hiroshi: *See—*
Okamoto, Kintaro; Kudo, Hirokatu; Ishijimi, Soichi; Kadoiri, Etsuro; Soma, Hiroshi; and Suzuki, Hiroyuki, 4,056,165, Cl. 181-141.000.

Sonderegger, Hans Conrad; and Baumgartner, Hans Ulrich, to Kistler Instrumente AG. Diaphragm arrangement for pressure transducers. 4,056,009, Cl. 73-406.000.

Sonenberg, Martin; and Yamasaki, Nobuyuki, to Research Corporation. Clinically active bovine growth hormone fraction. 4,056,520, Cl. 260-112.50R.

Sonnenberg, Helmut; and Kramer, Bruno, to Hoechst Aktiengesellschaft. Process permitting a polymerization batch to be additionally cooled. 4,056,667, Cl. 526-74.000.

Soodak, Charles; and Gelbman, Alexander, to Baxter Travenol Laboratories, Inc. Digital temperature controller. 4,056,708, Cl. 219-499.000.

Soper, Quentin Francis, to Eli Lilly and Company. Method of controlling aquatic weeds. 4,056,382, Cl. 71-66.000.

Spanur, Frank George; and Alberto, Vicente Santo Domingo, to Union Carbide Corporation. Primary dry cell having a novel venting closure. 4,056,659, Cl. 429-54.000.

Spasuik, Paul. Bale loading assembly. 4,056,204, Cl. 214-83.300.

Spaziante, Placido: *See—*
Giuffre, Luigi; De Nora, Vittorio; and Spaziante, Placido, 4,056,447, Cl. 204-98.000.

Spector, Marshall L., to Air Products and Chemicals, Inc. Production of non-bulking activated sludge. 4,056,465, Cl. 210-7.000.

Sperry Rand Corporation: *See—*
Thuet, Ronald Kent, 4,056,182, Cl. 197-1.00R.
Todd, Robert R.; and Rowland-Hill, Edward W., 4,056,107, Cl. 130-27.00R.

Spietschka, Ernst: *See—*
Schiessler, Siegfried; Spietschka, Ernst; and Elinkmann, Hans-Gerd, 4,056,534, Cl. 260-314.500.

Spilker, James W. Die changer. 4,056,207, Cl. 214-652.000.

Spooner, Archer Michael; and Murray, Paul Michael, to Redifon Limited. Optical systems for the display of visual images. 4,056,827, Cl. 358-87.000.

Spriggs, Dennis Mitchel: *See—*
Jett, Marion Barney; and Spriggs, Dennis Mitchel, 4,056,145, Cl. 166-212.000.

Springett, Brian E.; and Sarid, Dror, to Xerox Corporation. Rotatable corona device. 4,056,723, Cl. 250-324.000.

Sriramamurty, Durvasula V.; and Brzezinski, Donald E., to Johnson Controls, Inc. Fluid power piston actuators. 4,056,043, Cl. 92-13.200.

Staats, Henry N., to General Binding Corporation. Two stage oven laminator method. 4,056,422, Cl. 156-309.000.

Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Method for piecing a thread on open-end spinning units. 4,055,942, Cl. 57-156.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,055,942, Cl. 57-156.000.

Stamper, David John: *See—*
Thompson, William Henry; Worthington, Ralph Eric; and Stamper, David John, 4,056,604, Cl. 423-483.000.

Stancati, Nicholas F.; and Garner, Peter, to Acta Limited. Threaded anchor. 4,055,929, Cl. 52-705.000.

Standridge, Robert Ted: *See—*
Buchanan, Ronald Leslie; Partyka, Richard Anthony; and Standridge, Robert Ted, 4,056,540, Cl. 260-340.300.

Stanford Research Institute: *See—*
Henry, David W.; and Sturm, Priscilla A., 4,056,535, Cl. 260-326.200.

Staniland, Philip Anthony, to Imperial Chemical Industries Limited. Process for preparing aromatic polyethers. 4,056,511, Cl. 260-49.000.

Stannek, Karl Heinz, to Western Digital Corporation. Keyboard assembly momentary contact push button switch with tactile action. 4,056,700, Cl. 200-159.00R.

Star, Shlomo: *See—*
Baniel, Avraham Matitiahu; Mitzmager, Abraham; Segall, Jeanna; Star, Shlomo; and Shorr, Leonard Marshall, 4,056,588, Cl. 264-63.000.

Stauffer Chemical Company: *See—*
Lin, Chii-Fa, 4,056,612, Cl. 424-76.000.
Pallos, Ferenc M., 4,056,570, Cl. 260-562.00B.
Pallos, Ferenc M., 4,056,627, Cl. 424-300.000.
Walker, Francis H., 4,056,524, Cl. 260-239.0BF.

Stedman, Robert N., to Caterpillar Tractor Co. Endless track for crawler vehicles. 4,056,288, Cl. 305-34.000.

Steger, Thomas C. Joint for modular furniture. 4,056,067, Cl. 108-101.000.

Steiger, Anton: *See—*
Rutz, Peter; and Steiger, Anton, 4,056,042, Cl. 91-497.000.
Rutz, Peter; and Steiger, Anton, 4,056,080, Cl. 123-23.000.

Stein, Werner: *See—*
Franz, Arnold; and Stein, Werner, 4,056,656, Cl. 428-460.000.

Stenzel, Jurgen, to Hoechst Aktiengesellschaft. Process for utilizing ferrophosphorus. 4,056,388, Cl. 75-129.000.

Stepanian, Genrikh Gevorkovich: *See—*
Boyadzhian, Varazdat Karapetovich; Khachatrian, Saribek Saakovich; Stepanian, Genrikh Gevorkovich; Eritsian, Volodya Karapetovich; Agavelian, Edik Stepanovich; Nefedov, Oleg Matveevich; Dolgy, Igor Evgenievich; Sisin, Mikhail Fedorovich; Kolbasin, Alexei Yakovlevich; and Anikeev, Ivan Konstantinovich, 4,056,563, Cl. 560-245.000.

Stern, David, to Martin Paint and Chemical Corporation. Pressurized dispenser for aqueous emulsion paints. 4,056,213, Cl. 222-95.000.

Stern, David, to Martin Paint and Chemical Corporation. Aerosol-dispensed latex paint compositions. 4,056,500, Cl. 260-29.6MN.

Stewart, Thomas L.; and Cadena, Edward R., to Shell Oil Company. Basic sediment and water measurement. 4,055,986, Cl. 73-61.00R.

Stiefel, Kenneth Erwin, to Bell Telephone Laboratories, Incorporated. Telephone range extender with gain. 4,056,688, Cl. 179-16.00F.

Stiefel Laboratories, Inc.: *See—*
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Stith, William J.: *See—*
Geissler, Ulrich C.; and Stith, William J., 4,056,101, Cl. 128-214.00D.

Stokes, Rembert Ryan: *See—*
Meyerle, John Alfons; and Stokes, Rembert Ryan, 4,056,696, Cl. 179-100.00R.

Stoltefuss, Wilhelm; Haller, Herbert; and Huntcher, Ottocar, to Gewerkschaft Eisenhutte Westfalia. Machines for use in mining or tunnelling work. 4,056,284, Cl. 299-64.000.

Stone, Dale Eugene: *See—*
Bosik, Barry Sheldon; and Stone, Dale Eugene, 4,056,693, Cl. 179-84.00R.

Stoas, Peter Johannes; Herrmann, Manfred Franz Reinhold; and Satzinger, Gerhard, to Warner-Lambert Company. Benzo(b)thiophene derivatives. 4,056,526, Cl. 544-146.000.

Strandt, Margaret: *See—*
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Strategic Medical Research Corporation: *See—*
Gordon, Paul; Ronsen, Bruce; and Kulkarni, Shrikant V., 4,056,322, Cl. 536-4.000.

Stregack, Joseph A.; and Wexler, Bernard L., to United States of America, Navy. Electric discharge gas dynamic laser. 4,056,789, Cl. 331-94.50G.

Strehler, Hugo; Beer, Ludwig; Heil, Eduard; Urbanek, Friedrich; and

Fischer, Hermann, to BASF Aktiengesellschaft. Continuous manufacture of polybutylene terephthalates. 4,056,514, Cl. 260-75.00R.
Strella, Stephen, to Xerox Corporation. Apparatus and method for extending fuser release life. 4,056,706, Cl. 219-216.000.
Strickland, Frederick W., to General Dynamics Corporation. Cable gripping device. 4,055,875, Cl. 24-115.00R.
Strickland, John C.: *See—*
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Strobl, Georg: *See—*
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Stuckey, Milton C. Space humidifier. 4,056,049, Cl. 98-105.000.
Studiengesellschaft Kohle m.b.H.: *See—*
Wilke, Gunther; and Wilhelm, Kaiser, 4,056,552, Cl. 560-128.000.
Sturm, Priscilla A.: *See—*
Henry, David W.; and Sturm, Priscilla A., 4,056,535, Cl. 260-326.200.
Sublett, Bobby J.: *See—*
Gilkey, Russell; Hilbert, Samuel D.; Sublett, Bobby J.; and Wicker, Thomas H., Jr., 4,056,356, Cl. 8-168.00C.
Suehiro, Akio, to Hitachi, Ltd. Audio transmitting and receiving system. 4,056,683, Cl. 179-1.0AT.
Sugisawa, Ko: *See—*
Sakakibara, Sakuichi; Sugisawa, Ko; and Kitamura, Yukio, 4,056,566, Cl. 426-577.000.
Sukhov, Andrei Borisovich: *See—*
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Sullivan, Dennis J. Excavating tool. 4,056,151, Cl. 173-141.000.
Sullivan, Donald F. Printed circuit board open circuit tester. 4,056,773, Cl. 324-73.0PC.
Sulzer Brothers Limited: *See—*
Rutz, Peter; and Steiger, Anton, 4,056,042, Cl. 91-497.000.
Rutz, Peter; and Steiger, Anton, 4,056,080, Cl. 123-23.000.
Sumitomo Chemical Company, Limited: *See—*
Sano, Takezo; and Sasaki, Masao, 4,056,456, Cl. 204-165.000.
Takayama, Chiyozo; Hisada, Yoshio; Kato, Toshiro; and Fujinami, Akira, 4,056,622, Cl. 424-273.00R.
Sumitomo Metal Industries Limited: *See—*
Fujii, Yoshihisa; and Fujiwara, Akio, 4,056,412, Cl. 148-153.000.
Sun, Kuan H.: *See—*
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Wagers, Robert S.; and Hartmann, Clinton S., 4,056,793, Cl. 333-72.000.
Wood, George William; and Sallas, John James, 4,056,163, Cl. 181-113.000.
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Thornton, Jack L. Truss web cutter. 4,056,031, Cl. 83-794.000.
Thuet, Ronald Kent, to Sperry Rand Corporation. Stylus actuator. 4,056,182, Cl. 197-1.00R.
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Townsend, Nicholas A., to British Steel Corporation. Scrap treatment. 4,056,231, Cl. 241-23.000.
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Trimble, Steven M. Portable boat-carried rack for water skis and tow ropes. 4,056,220, Cl. 224-42.45R.
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de Boer, Jacob; and Walraven, Anthonie, 4,056,832, Cl. 360-77.000.
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Martin, Anthony Newman, 4,056,732, Cl. 307-33.000.
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Jojima, Teruomi; Tsuji, Hideakira; Yamamoto, Shinjiro; and Omino, Teiji, 4,056,617, Cl. 424-200.000.
Yamamoto, Toshio: *See—*
Iizaka, Isao; and Yamamoto, Toshio, 4,056,390, Cl. 96-1.0TE.
Yamamoto, Yukio; and Nagase, Mitsuo, to Yoshida Kogyo Kabushiki Kaisha. Exterior window unit having frame header. 4,055,916, Cl. 49-404.000.
Yamanaka, Teruo: *See—*
Makino, Takayuki; Yamanaka, Teruo; Kuroyanagi, Yoshitaka; and Teratani, Tatsuo, 4,056,782, Cl. 325-313.000.

Yamasaki, Nobuyuki: *See*—
Sonenberg, Martin; and Yamasaki, Nobuyuki, 4,056,520, Cl. 260-112.50R.
Yamashita, Norio: *See*—
Ikeguchi, Shigehiko; Yamashita, Norio; and Matsuda, Eiji, 4,056,181, Cl. 194-10.000.
Yates, Patrick D. Hose rolling device. 4,056,241, Cl. 242-86.400.
Yates, Richard Alan: *See*—
Huang, Hua-Feng; and Yates, Richard Alan, 4,056,638, Cl. 426-244.000.
Yokono, Hitoshi: *See*—
Nishikawa, Akio; Yokono, Hitoshi; Numata, Shun-ichi; and Mukai, Junji, 4,056,579, Cl. 260-830.00P.
Yokota, Akihiro: *See*—
Shoji, Kunihiro; Yokota, Akihiro; and Watanabe, Kenzo, 4,055,963, Cl. 62-238.000.
York, David L.: *See*—
York, Richard N.; and York, David L., 4,056,427, Cl. 156-580.000.
York, Richard N.; and York, David L., to Precise Corporation. Focus collimator press for a collimator for gamma ray cameras. 4,056,427, Cl. 156-580.000.
Yoshida, Hiroshi, to Yoshida Kogyo Kabushiki Kaisha. Method of making a coupling element for a slide fastener. 4,055,882, Cl. 29-410.000.
Yoshida Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Yukio; and Nagase, Mitsuo, 4,055,916, Cl. 49-404.000.
Yoshida, Hiroshi, 4,055,882, Cl. 29-410.000.
Yoshida, Minoru, to Laurel Bank Machine Co., Ltd. Sheet holder attachment adapted to be used with sheet holder for sheet counter. 4,056,193, Cl. 211-51.000.
Yoshimura, Masayoshi, to Hitachi, Ltd. Etching method for flattening a silicon substrate utilizing an anisotropic alkali etchant. 4,056,413, Cl. 148-175.000.
Young, Henry Y., to Stiefel Laboratories, Inc. Therapeutic composition. 4,056,611, Cl. 424-62.000.
Young, Jon R.: *See*—
Rampel, Guy G.; and Young, Jon R., 4,056,660, Cl. 429-59.000.
Young, Patricia A.: *See*—
Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximillian, 4,056,532, Cl. 260-296.00R.
Connor, David T.; Young, Patricia A.; and von Strandtmann, Maximilian, 4,056,619, Cl. 424-263.000.
Young, Thomas A.: *See*—
Repay, Laszlo N.; and Young, Thomas A., 4,056,253, Cl. 248-479.000.
Yourke, Hannon S.: *See*—
Davis, Donald E.; Habegger, Millard A.; and Yourke, Hannon S., 4,056,730, Cl. 250-492.00R.
Yukio, Takayanagi: *See*—
Keikichi, Tsukioka; and Yukio, Takayanagi, 4,056,753, Cl. 313-325.000.
Zagorskaya, Maina Konstantinovna: *See*—
Vulikh, Alexandr Ilich; Zagorskaya, Maina Konstantinovna; Kofman, Izrail Zalmanovich; Pavlovich, Inna Vasilievna; Levitan, Boris Veniaminovich; Troyan, Nikolai Vasilievich; and Dubyaga, Sergei Viktorovich, 4,056,605, Cl. 423-484.000.
Zaharko, Joe Dennis: *See*—
Rivers, Joseph Tracy, Jr.; and Zaharko, Joe Dennis, 4,055,941, Cl. 57-149.000.
Zakrzewski, Gary S.: *See*—
Misencik, John J.; and Zakrzewski, Gary S., 4,056,837, Cl. 361-45.000.
Zander, Hans-Hermann, to Siemens Aktiengesellschaft. Commutation circuit for a cycloconverter with intermediate D.C. link. 4,056,766, Cl. 63-37.000.
Zebree, David T., to Hercules Incorporated. Closed initiator system including explosive energy-initiatable blasting caps, and method. 4,056,059, Cl. 102-22.00R.
Zeichner, David A.: *See*—
Clinton, Henry H.; and Zeichner, David A., 4,056,771, Cl. 324-54.000.
Zellhoefer, Glenn F., to National Union Electric Corporation. Thermal cells and electrolyte composition therefor. 4,056,662, Cl. 429-112.000.
Zenith Radio Corporation: *See*—
Burgyan, Lajos, 4,056,685, Cl. 179-15.0BT.
Ziamatic Corporation: *See*—
Cobb, Clyde A., 4,056,017, Cl. 74-522.000.
Zickendraht, Christian: *See*—
Schwander, Hansrudolf; Burdeska, Kurt; and Zickendraht, Christian, 4,056,528, Cl. 260-250.00Q.
Zielinski, Martin. Multiplexed signal reference level equalizer. 4,056,686, Cl. 179-15.0BL.
Zielke, Rainer: *See*—
Diamantoglou, Michael; Magerlein, Helmut; Zielke, Rainer; and Cornelissens, Emery George Philomena, 4,056,400, Cl. 106-162.000.
Zimmer, Johannes. Rotary screen supporting and tensioning means. 4,056,055, Cl. 101-128.100.
Zimmer USA, Inc.: *See*—
Farling, Gene M., 4,055,862, Cl. 3-1.910.
Zischinsky, Ulf: *See*—
Kamann, Gunther; Krahe, Jurgen; Zischinsky, Ulf; and Gotze, Wilhelm, 4,056,036, Cl. 85-63.000.
Zizine, Jean Louis, to S.C.I. Le Brin. Device for measuring the mass flow or flow rate of a gas. 4,056,003, Cl. 73-194.00F.
Zoche, Gunter: *See*—
Riegger, Paul, Richtzenhain, Hermann; and Zoche, Gunter, 4,056,454, Cl. 204-163.00R.
Zorn, Jurgen; Vlemmings, Jan; Muller, Karl-Heinz; Mayer, Siegfried; Dworak, Wilhelm; Hartmann, Eugen; Fader, Martin; Talmon, Wolfgang; Jons, Claus; Sauer, Ivan; and Bosch, Paul, to Robert Bosch GmbH. External gear type fluid displacing machine with bearing gap. 4,056,337, Cl. 418-131.000.
Zumwalt, Homer, to Rockwell International Corporation. Support and retention liner gasket. 4,056,211, Cl. 220-9.00G.
Zutrauen, Howard C. Method and apparatus for making a print of an object. 4,056,316, Cl. 355-22.000.
Zwahlen, Ernst, to Elex A.G. Anti-bridging device. 4,056,215, Cl. 222-231.000.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976	B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977	B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976	B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977	B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976	B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976	B 475,801	4,056,759	Mar. 30, 1976	Nov. 1, 1977
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977	B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976	B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976	B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976	B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976	B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977	B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976	B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976	B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977	B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 461,752	4,016,54[illegible]	Apr. 20, 1976	Apr. 5, 1977	B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 461,874	3,982,27[illegible]	Jan. 27, 1976	Sep. 21, 1976	B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977	B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976	B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976	B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976	B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976	B 478,759	4,055,681	Mar. 16, 1976	Oct. 25, 1977
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976	B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976	B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977	B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977	B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976	B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976	B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976	B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977	B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976	B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976	B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976	B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976	B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976	B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976	B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976	B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977	B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976	B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977	B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976	B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976	B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976	B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976	B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976	B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976	B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976	B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976	B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976	B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976	B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977	B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976	B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977	B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977	B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977	B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977	B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976	B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976	B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977	B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976	B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976	B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976	B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977	B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976	B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977	B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977	B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977	B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976	B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976	B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976	B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976	B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977	B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976	B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976	B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976	B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977	B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976	B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976	B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,440	4,056,502	Feb. 17, 1976	Nov. 1, 1977
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977	B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976	B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976	B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976	B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977	B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976	B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976	B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977	B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977	B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976	B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977	B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976	B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976	B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976	B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976	B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976	B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976	B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977	B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977	B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976	B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976	B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976	B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976	B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976	B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976	B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976	B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976	B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976	B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976	B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977	B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976	B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976	B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976	B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976	B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976	B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976	B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977	B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976	B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976	B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976	B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976	B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976	B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977	B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976	B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976	B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976	B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976	B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977	B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976	B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977	B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977	B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976	B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977	B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976	B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976	B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977	B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976	B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976	B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977	B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976	B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976	B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976	B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976	B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976	B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977	B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976	B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977	B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977	B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977	B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976	B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976	B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976	B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 1ST DAY OF NOVEMBER, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F. Antimicrobial fatty ester-amides. T964,006, 11-1-77, Cl. 260-404.000.

Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F. Antimicrobial esters of aliphatic diols. T964,007, 11-1-77, Cl. 260-410.500.

Blanken, Thomas C. Adhesive compositions having a carbon black component. T964,011, 11-1-76, Cl. 428-489.000.

Boudreaux, Gordon J.: *See*—
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., T964,006, Cl. 260-404.000.
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., T964,007, Cl. 260-410.500.

Chiu, Te-Long; and Vora, Madhukar B. High voltage semiconductor structure. T964,009, 11-1-77, Cl. 357-23.000.

Clark, Gary T.: *See*—
Coates, Clarence A., Jr.; and Clark, Gary T., T964,005, Cl. 8-26.000.

Coates, Clarence A., Jr.; and Clark, Gary T. Monoazo dye mixtures. T964,005, 11-1-77, Cl. 8-26.000.

Davy, L. Nevil. Time-base instability compensation apparatus for use in copy/duplication. T964,004, 11-1-77, Cl. 179-15.55T.

Ellis, Howard F.: *See*—
Pitha, John J.; and Ellis, Howard F., T964,010, Cl. 428-210.000.

Ferwerda, Thomas Norvin. Structural integrated assembly of relatively rigid tubular members including at least one smaller such member extending through and anchored to such larger member. T964,001, 11-1-77, Cl. 52-637.000.

Hunt, William Edward. Separation member return means for use in recirculating feeders. T964,008, 11-1-77, Cl. 355-50.000.

Kuchek, Henry A. Method to purify magnesium chloride to produce a flux for molten magnesium. T964,002, 11-1-77, Cl. 75-67.00A.

Novak, Arthur F.: *See*—
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., T964,006, Cl. 260-404.000.
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., T964,007, Cl. 260-410.500.

Pitha, John J.; and Ellis, Howard F. Non-linear resistance overvoltage surge arrester disc with ceramic collar and method for applying. T964,010, 11-1-77, Cl. 428-210.000.

Rehrer, Wilson P. Hardenable martensitic stainless steel. T964,003, 11-1-77, Cl. 75-128.00G.

Sumrell, Gene: *See*—
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., T964,006, Cl. 260-404.000.
Bailey, August V.; Boudreaux, Gordon J.; Sumrell, Gene; and Novak, Arthur F., T964,007, Cl. 260-410.500.

Vora, Madhukar B.: *See*—
Chiu, Te-Long; and Vora, Madhukar B., T964,009, Cl. 357-23.000.

LIST OF REISSUE PATENTEES

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bognaes, Ragnar; and Solberg, Olav, to Kvaerner Brug A/S. Tanker for liquified and/or compressed gas. Re. 29,463, Cl. 62-55.000.

Caldwell, Richard L.: *See*—
Givens, Wyatt W.; Caldwell, Richard L.; and Mills, William R., Jr., Re. 29,466, Cl. 250-269.000.

Eli Lilly and Company: *See*—
Johnson, Irving S., Re. 29,465, Cl. 424-180.000.

Givens, Wyatt W.; Caldwell, Richard L.; and Mills, William R., Jr., to Mobil Oil Corporation. In-situ assaying for uranium in rock formations. Re. 29,466, Cl. 250-269.000.

Howard, Colin Robert: *See*—
Loukes, David Gordon; Maltman, William Ramsey; and Howard, Colin Robert, Re. 29,464, Cl. 65-30.00E.

Johnson, Irving S., to Eli Lilly and Company. Psoriasis treatment with mycophenolic acid. Re. 29,465, Cl. 424-180.000.

Kvaerner Brug A/S: *See*—
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Loukes, David Gordon; Maltman, William Ramsey; and Howard, Colin Robert, to Pilkington Brothers Limited. Manufacture of glass. Re. 29,464, Cl. 65-30.00E.

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Loukes, David Gordon; Maltman, William Ramsey; and Howard, Colin Robert, Re. 29,464, Cl. 65-30.00E.

Mills, William R., Jr.: *See*—
Givens, Wyatt W.; Caldwell, Richard L.; and Mills, William R., Jr., Re. 29,466, Cl. 250-269.000.

Mobil Oil Corporation: *See*—
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Pilkington Brothers Limited: *See*—
Loukes, David Gordon; Maltman, William Ramsey; and Howard, Colin Robert, Re. 29,464, Cl. 65-30.00E.

Solberg, Olav: *See*—
Bognaes, Ragnar; and Solberg, Olav, Re. 29,463, Cl. 62-55.000.

Tchakgarian, Rene Verazin. Luminous outdoor sign board resistant to inclement weather. Re. 29,462, Cl. 40-130.00R.

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Surabian, Dennis. Plum tree. 4,140, 11-1-77, Cl. 38.000.

Surabian, Dennis. Nectarine tree. 4,141, 11-1-77, Cl. 41.000.

Warriner, William A., to Jackson & Perkins Co. Rose plant. 4,139, 11-1-77, Cl. 28.000.

Williams, J. Benjamin. Rose plant. 4,138, 11-1-77, Cl. 17.000.

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Baker, John Geoffrey, 246,268, Cl. D48-16.00R.
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Beckner, Greta A., administratrix: *See—*
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Bellini, Mario, to Nippon Gakki Seizo Kabushiki Kaisha. Headphone. 246,242, 11-1-77, Cl. D14-36.000.
Benes, Frank J., to Anchor Hocking Corporation. Compote dish or similar article. 246,220, 11-1-77, Cl. D7-22.000.
Boas, Donald P., to Florida Cycle Supply Company. Automobile luggage rack. 246,238, 11-1-77, Cl. D12-157.000.
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Dee, Edward. Combined rotatable confection and handle. 246,207, 11-1-77, Cl. D1-22.000.
Doerner, Frank. Chair control unit. 246,217, 11-1-77, Cl. D6-191.000.
Douglas, Thomas E., to Rubbermaid Industrial Products Corporation. Shipping drum or the like. 246,227, 11-1-77, Cl. D9-170.000.
Dyrup, Sven Erik, to Trelleborgs Gummifabriks Aktiebolag. Lathlike element for sieves. 246,247, 11-1-77, Cl. D15-147.000.
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Goodman, Arnold Z. Shirt hanger or similar article. 246,218, 11-1-77, Cl. D6-247.000.
Hansen, David E., to Eastman Kodak Company. Rechargeable power pack. 246,240, 11-1-77, Cl. D13-8.000.
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Hetherington, Susan Kaye. Artificial flower. 246,233, 11-1-77, Cl. D11-117.000.
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Truette, Danny Michael, to Pelton & Crane Company. Dental console. 246,256, 11-1-77, Cl. D24-4.000.
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717	4,055,930

CLASS 53

22 B	4,055,931
63	4,055,932
187	4,055,933
198 B	4,055,934
247	4,055,943

CLASS 55

2	4,056,368
58	4,056,369
68	4,056,370
90	4,056,371
152	4,056,372
158	4,056,373
377	4,056,374
381	4,056,375
497	4,056,376

CLASS 56

10.3	4,055,935

CLASS 57

34 R	4,055,936
	4,055,937
58.89	4,055,938
62	4,055,939
77.4	4,055,940
149	4,055,941
156	4,055,942

CLASS 58

85.5	4,055,945
115	4,055,944

CLASS 60

204	4,055,946
221	4,055,947
269	4,055,949
398	4,055,950
514	4,055,951
517	4,055,952
526	4,055,953
527	4,055,954
	4,055,955
	4,055,956
535	4,055,957
641	4,055,948

CLASS 61

41 R	4,055,958
85	4,055,959

CLASS 62

6	4,055,960
54	4,055,961
55	Re.29,463
102	4,055,962
238	4,055,963
	4,055,964
324	4,055,965

CLASS 63

37	4,056,766

CLASS 64

13	4,055,966
28 R	4,055,967

CLASS 65

4 A	4,056,377
18	4,056,378
30 E	Re.29,464
106	4,056,379

CLASS 66

151	4,055,968
204	4,055,969

CLASS 68

5 E	4,055,970
9	4,055,971

CLASS 70

21	4,055,972
58	4,055,973

CLASS 71

9	4,056,380
11	4,055,974
36	4,056,381
66	4,056,382
90	4,056,383
92	4,056,384
111	4,056,385

CLASS 72

42	4,055,975
83	4,055,976
84	4,055,977
254	4,055,978
262	4,055,979
410	4,055,980
415	4,055,981

CLASS 73

15 B	4,055,982
37.5	4,055,983
40.7	4,055,984
49.2	4,055,985
61 R	4,055,986
61.1 C	4,055,987
73	4,055,991
88 B	4,055,992
116	4,055,993
	4,055,994
	4,055,995
117	4,055,996
117.3	4,055,997
119 R	4,055,998
145	4,055,999
151	4,056,004
170 R	4,056,000
189	4,056,001
194 F	4,056,003
194 R	4,056,002
339 R	4,056,005
	4,056,006
343 R	4,056,007
398 AR	4,056,008
406	4,056,009
432 R	4,056,010
588	4,055,989
620	4,055,988
623	4,055,990

CLASS 74

50	4,056,011
81	4,056,012
217 B	4,056,013
230.17 F	4,056,015
230.4	4,056,014
231 J	4,056,016
522	4,056,017
665 P	4,056,018
677	4,056,019

CLASS 75

0.5 BA	4,056,386
123 F	4,056,387
129	4,056,388
171	4,056,389

CLASS 81

177 A	4,056,020

CLASS 83

4	4,056,021
62	4,056,022
155	4,056,023
210	4,056,024
261	4,056,025
454	4,056,026
455	4,056,027
575	4,056,029
745	4,056,028
762	4,056,030
794	4,056,031

CLASS 84

1.01	4,056,032
1.24	4,056,033
267	4,056,034

CLASS 85

8.9	4,056,035
63	4,056,036
74	4,056,037

CLASS 89

128	4,056,038

CLASS 90

92	4,056,039

CLASS 91

25	4,056,040
375 R	4,056,041
497	4,056,042

CLASS 92

13.2	4,056,043
159	4,056,044

CLASS 93

35 SB	4,056,045
49 M	4,056,047
49 R	4,056,046

CLASS 96

1 PC	4,056,391
1 TE	4,056,390
3	4,056,392
27 H	4,056,393
29 D	4,056,394
36	4,056,395
67	4,056,396
77	4,056,397

CLASS 98

41 R	4,056,048
105	4,056,049

CLASS 99

305	4,056,050
516	4,056,051

CLASS 100

39	4,056,052
218	4,056,053

CLASS 101

45	4,056,054
128.1	4,056,055
152	4,056,056
382 MV	4,056,057

CLASS 102

16	4,056,058
22 R	4,056,059
52	4,056,060
70.2 P	4,056,061
86.5	4,056,062

CLASS 104

88	4,056,063
93	4,056,064

CLASS 105

199 C	4,056,065
493	4,056,066

CLASS 106

65	4,056,398
69	4,056,399
162	4,056,400
277	4,056,401
308 Q	4,056,402

CLASS 108

101	4,056,067

CLASS 110

7 R	4,056,069
8 A	4,056,068

CLASS 112

158 B	4,056,070
237	4,056,071

CLASS 114

109	4,056,072
151	4,056,073
280	4,056,074

CLASS 118

7	4,056,075
653	4,056,076

CLASS 119

14.08	4,056,077
158	4,056,078

CLASS 122

476	4,056,079

CLASS 123

23	4,056,080
75 B	4,056,081
103 R	4,056,082
119 A	4,056,083
	4,056,084
119 B	4,056,085
122 R	4,056,086
127	4,056,087
148 E	4,056,088
198 B	4,056,089

CLASS 126

121	4,056,091
271	4,056,090
	4,056,092
	4,056,093
	4,056,094

CLASS 128

1 R	4,056,095
1.1	4,056,096
1.5	4,056,097
142 R	4,056,098
145.6	4,056,099
214 C	4,056,100
214 D	4,056,101
218 F	4,056,102
285	4,056,103
351	4,056,104
419 PG	4,056,105
583	4,056,106

CLASS 130

27 R	4,056,107

CLASS 131

17 R	4,056,108

CLASS 132

40	4,056,109
84 R	4,056,110
88.7	4,056,111

CLASS 134

6	4,056,112
22 R	4,056,403
40	4,056,113
104	4,056,114

CLASS 135

67	4,056,115

CLASS 136

89 PC	4,056,404
	4,056,405
208	4,056,406
232	4,056,407

CLASS 137

68 R	4,056,116
	4,056,117
201	4,056,118
315	4,056,119
493.9	4,056,120
541	4,056,121
563	4,056,122
624.14	4,056,123
625.17	4,056,124
625.3	4,056,125
625.65	4,056,126

CLASS 138

30	4,056,127

CLASS 140

93.4	4,056,128

CLASS 141

24	4,056,129
67	4,056,130
206	4,056,131
285	4,056,132
301	4,056,133
392	4,056,234

CLASS 144

2 Z	4,056,134
	4,056,135
134 D	4,056,136
323	4,056,137

CLASS 148

1.5	4,056,408
6.15 R	4,056,409
105	4,056,410
121	4,056,411
153	4,056,412
175	4,056,413
	4,056,414
187	4,056,415

CLASS 149

19.91	4,056,416

CLASS 150

.5	4,056,138
39	4,056,139

CLASS 156

64	4,056,417
145	4,056,418
164	4,056,419
181	4,056,420
272	4,056,421
309	4,056,422
356	4,056,423
384	4,056,424
499	4,056,425
505	4,056,426
580	4,056,427
642	4,056,428

CLASS 162

17	4,056,429
76	4,056,430
165	4,056,431
168 NA	4,056,432
290	4,056,433

CLASS 164

4	4,056,140

CLASS 165

9	4,056,141
133	4,056,142
176	4,056,143

CLASS 166

85	4,056,144
212	4,056,145
300	4,056,146

CLASS 172

68 4,056,147
311 4,056,148
4,056,149

CLASS 173

127 4,056,150
141 4,056,151

CLASS 174

13 4,056,679
19 4,056,680
35 GC 4,056,682
52 FP 4,056,681

CLASS 175

330 4,056,152
376 4,056,153
416 4,056,154

CLASS 176

19 R 4,056,434
30 4,056,435
38 4,056,436
40 4,056,437
50 4,056,438
65 4,056,439
78 4,056,440
4,056,441

CLASS 177

145 4,056,155
209 4,056,156

CLASS 179

1 AT 4,056,683
5 R 4,056,684
15 BL 4,056,686
15 BT 4,056,685
16 F 4,056,687
4,056,688
4,056,689
17 A 4,056,690
18 FA 4,056,691
84 R 4,056,693
4,056,694
84 VF 4,056,692
99 4,056,695
100 R 4,056,696
115.5 PV 4,056,697
175.2 C 4,056,698

CLASS 180

6.48 4,056,158
105 E 4,056,157
120 4,056,159
143 4,056,160

CLASS 181

113 4,056,163
114 4,056,164
141 4,056,165
290 4,056,161

CLASS 182

5 4,056,166
10 4,056,167

CLASS 184

6.24 4,056,168

CLASS 187

29 R 4,056,169
52 R 4,056,162
95 4,056,170

CLASS 188

18 A 4,056,171
26 4,056,172
71.9 4,056,173
73.5 4,056,174
196 BA 4,056,175

CLASS 192

4 A 4,056,176
58 B 4,056,178
032 4,056,177
106.2 4,056,179

CLASS 193

35 J 4,056,180

CLASS 194

10 4,056,181

CLASS 195

62 4,056,442

CLASS 197

1 R 4,056,182
4,056,183

CLASS 198

339 4,056,186
394 4,056,187
465 4,056,188
471 4,056,184
484 4,056,185
514 4,056,189

CLASS 200

5 A 4,056,699
159 R 4,056,700
314 4,056,701

CLASS 201

5 4,056,443

CLASS 203

26 4,056,444

CLASS 204

1 T 4,056,445
4,056,446
98 4,056,447
4,056,448
106 4,056,449
159.23 4,056,453
163 R 4,056,454
4,056,455
165 4,056,456
192 SP 4,056,457
201 4,056,450
258 4,056,452
263 4,056,458
286 4,056,459
305 4,056,451

CLASS 206

349 4,056,190
629 4,056,191

CLASS 208

8 4,056,460
11 R 4,056,461
308 4,056,462

CLASS 209

111.7 R 4,056,463
425 4,056,464

CLASS 210

7 4,056,465
10 4,056,466
23 F 4,056,467
31 R 4,056,468
62 4,056,469
94 4,056,470
186 4,056,471
242 S 4,056,472
331 4,056,473
390 4,056,474
402 4,056,475
446 4,056,476
522 4,056,477

CLASS 211

13 4,056,192
51 4,056,193
131 4,056,194
153 4,056,195
207 4,056,196

CLASS 214

1 BC 4,056,197
4,056,198
6 BA 4,056,199
7 4,056,200
16.4 A 4,056,201
17 C 4,056,202
75 T 4,056,203
83.3 4,056,204
145 R 4,056,205
302 4,056,206
652 4,056,207

CLASS 215

12 R 4,056,208
215 4,056,209

CLASS 219

69 C 4,056,702
71 4,056,703
121 P 4,056,704
125 R 4,056,705
216 4,056,706
302 4,056,707
499 4,056,708

CLASS 220

4 E 4,056,235
9 G 4,056,211
90.4 4,056,210
244 4,056,212

CLASS 222

95 4,056,213
231 4,056,215
385 4,056,216
600 4,056,217
608 4,056,214

CLASS 224

2 C 4,056,218
36 4,056,219
42.45 R 4,056,220

CLASS 229

14 BL 4,056,221
15 4,056,222
32 4,056,223

CLASS 233

14 R 4,056,224
20 R 4,056,225

CLASS 235

30 R 4,056,709
437 4,056,710
440 4,056,712

CLASS 239

172 4,056,226
227 4,056,227
274 4,056,228
288 4,056,229

CLASS 241

15 4,056,230
23 4,056,231
39 4,056,233
194 4,056,232

CLASS 242

18 DD 4,056,236
18 PW 4,056,237
25 R 4,056,238
47.01 4,056,239
47.09 4,056,240
86.4 4,056,241
107.4 R 4,056,242
128 4,056,243
197 4,056,244
4,056,245
219 4,056,246

CLASS 244

110 C 4,056,247
137 R 4,056,248

CLASS 248

9 4,056,249
14 4,056,250
19 4,056,251
56 4,056,252
479 4,056,253

CLASS 249

210 4,056,254

CLASS 250

199 4,056,719
203 R 4,056,720
213 VT 4,056,721
231 SE 4,056,722
269 Re.29,466
324 4,056,723
328 4,056,724
336 4,056,725
370 4,056,726
385 4,056,727
396 R 4,056,728
472 4,056,729
492 R 4,056,730
556 4,056,731

CLASS 251

129 4,056,255

CLASS 252

12.4 4,056,478
18 4,056,479
78.5 4,056,480
140 4,056,481
301.1 W 4,056,482
373 4,056,483
408 4,056,484
4,056,485
417 4,056,486
435 4,056,487
449 4,056,488
462 4,056,489
468 4,056,490
557 4,056,491

CLASS 254

106 4,056,256
194 4,056,257

CLASS 260

18 S 4,056,492
22 A 4,056,494
22 CA 4,056,495
22 TN 4,056,493
23 H 4,056,499
23.7 C 4,056,498
29.6 MN 4,056,500
29.6 N 4,056,502
29.6 SQ 4,056,501
29.6 T 4,056,503
29.6 TA 4,056,496
4,056,497
37 PC 4,056,504
42.18 4,056,505
4,056,506
45.75 B 4,056,508
45.8 N 4,056,507
46.5 G 4,056,561
47 EP 4,056,510
49 4,056,511
59 R 4,056,512
62 4,056,513
75 R 4,056,514
79.1 4,056,515
79.3 M 4,056,516
4,056,517
112.5 R 4,056,519
4,056,520
203 4,056,522
205 4,056,523
239 BD 4,056,525
239 BF 4,056,524
239.1 4,056,521
250 Q 4,056,528
251 A 4,056,529
267 4,056,530
268 PL 4,056,531
296 R 4,056,532
314.5 4,056,534
326.14 R 4,056,539
326.2 4,056,535
326.5 B 4,056,536
4,056,537
4,056,538
340.3 4,056,540
343 4,056,541
346.3 4,056,542
348.59 4,056,543
378 4,056,544
410 4,056,545
448.8 R 4,056,546
453 P 4,056,547
455 A 4,056,549
455 R 4,056,548
465 D 4,056,550
4,056,560
465 G 4,056,509
512 C 4,056,564
535 P 4,056,567
543 H 4,056,568
558 S 4,056,569
561 N 4,056,565
562 B 4,056,570
583 E 4,056,571
624 R 4,056,572
631.5 4,056,573
654 R 4,056,574
673.5 4,056,575
683.3 4,056,576
683.47 4,056,578
683.48 4,056,577
830 P 4,056,579
881 4,056,580
972 4,056,581

CLASS 261

30 4,056,582
36 A 4,056,583

CLASS 264

.5 4,056,584
19 4,056,585
44 4,056,586
46.3 4,056,595
53 4,056,587
63 4,056,588
65 4,056,589
89 4,056,590
108 4,056,591
141 4,056,592
145 4,056,593
166 4,056,596
169 4,056,597
176 R 4,056,594
184 4,056,598

CLASS 266

101 4,056,261
138 4,056,262

CLASS 271

3 4,056,263
177 4,056,264

CLASS 272

70 4,056,265

CLASS 273

9 4,056,266
72 A 4,056,267
118 R 4,056,268
218 4,056,269

CLASS 280

166 4,056,270
745 4,056,271

CLASS 285

140 4,056,272
337 4,056,273

CLASS 292

17 4,056,275
201 4,056,276
341.16 4,056,277

CLASS 294

19 R 4,056,278

CLASS 296

1 S 4,056,279
137 G 4,056,274
146 4,056,280

CLASS 297

220 4,056,281
389 4,056,282

CLASS 298

17.6 4,056,283

CLASS 299

64 4,056,284

CLASS 301

8 4,056,285

CLASS 303

20 4,056,286
91 4,056,287

CLASS 305

34 4,056,288
47 4,056,289

CLASS 307

33 4,056,732
88.3 4,056,290
115 4,056,733
254 4,056,734
273 4,056,735
289 4,056,736
304 4,056,737
359 4,056,738
360 4,056,739
362 4,056,740

CLASS 308

189 R 4,056,291
206 4,056,292
217 4,056,293

CLASS 310

21 4,056,743
51 4,056,744
52 4,056,745
115 4,056,746
155 4,056,747
168 4,056,748
239 4,056,749
322 4,056,741
357 4,056,742

CLASS 312

30 4,056,294
107 4,056,295
184 4,056,296

CLASS 313

177 4,056,750
217 4,056,751
4,056,752
325 4,056,753
390 4,056,754
402 4,056,755

CLASS 315

39.69 4,056,756
86 4,056,757
381 4,056,758

CLASS 318

98 4,056,759
115 4,056,760
116 4,056,761
484 4,056,762
675 4,056,763

CLASS 320

3 4,056,764
48 4,056,765

CLASS 324

54 4,056,771
72 4,056,772
73 PC 4,056,773
142 4,056,774
4,056,775
158 P 4,056,777
158 SC 4,056,776
166 4,056,778
205 4,056,770
236 4,056,769

CLASS 325

4 4,056,779
5 4,056,780
55 4,056,781
313 4,056,782

CLASS 330

53 4,056,785
207 A 4,056,786
268 4,056,783
287 4,056,784

CLASS 331

59 4,056,787
78 4,056,788
94.5 G 4,056,789

CLASS 333

5 4,056,790
18 4,056,791
31 R 4,056,792
72 4,056,793

CLASS 334

15 4,056,794
4,056,795
55 4,056,796

CLASS 335

6 4,056,797
16 4,056,798
277 4,056,799
296 4,056,800

CLASS 339

23 4,056,297
90 R 4,056,298
95 D 4,056,299
103 R 4,056,300
263 R 4,056,301
275 B 4,056,302

CLASS 340

2 4,056,801
3 R 4,056,802
15 4,056,803
146.3 J 4,056,804
148 4,056,805
166 EL 4,056,806
166 R 4,056,807
171 PF 4,056,808
224 4,056,815
253 A 4,056,816
253 Y 4,056,817
309.4 4,056,818
347 C 4,056,820
347 DD 4,056,819

CLASS 346

76 R 4,056,822
4,056,823

CLASS 350

36 4,056,303
96 C 4,056,305
96 WG 4,056,304
160 LC 4,056,306
181 4,056,307
184 4,056,308
310 4,056,309

CLASS 351

6 4,056,310
169 4,056,311

CLASS 352

90 4,056,312

CLASS 353

3 4,056,313

CLASS 354

300 4,056,824

CLASS 355

10 4,056,314
4,056,315
22 4,056,316
32 4,056,317
45 4,056,318
68 4,056,319
75 4,056,320
99 4,056,321

CLASS 356

106 R 4,056,323
246 4,056,324

CLASS 357

23 4,056,825

CLASS 358

19 4,056,826
87 4,056,827
133 4,056,828
256 4,056,829

CLASS 360

51 4,056,830
77 4,056,831
4,056,832
85 4,056,833
4,056,834
105 4,056,835
106 4,056,518

CLASS 361

4	4,056,836
45	4,056,837
68	4,056,838
	4,056,839
124	4,056,840
203	4,056,841
293	4,056,842

CLASS 362

306	4,056,718

CLASS 363

79	4,056,768
141	4,056,767

CLASS 364

111	4,056,714
200	4,056,711
	4,056,809
	4,056,843
	4,056,844
	4,056,845
	4,056,846
	4,056,847
	4,056,848
510	4,056,717
514	4,056,715
515	4,056,716
521	4,056,713
900	4,056,821
	4,056,849
	4,056,850
	4,056,851

CLASS 365

8 TF	4,056,814
12	4,056,813
17	4,056,812
189	4,056,811
205	4,056,810

CLASS 366

15	4,056,259
144	4,056,260
160	4,056,258

CLASS 401

65	4,056,325

CLASS 402

30	4,056,326

CLASS 403

172	4,056,327

CLASS 404

96	4,056,328

CLASS 408

6	4,056,329

CLASS 415

1	4,056,330
15	4,056,331

CLASS 416

97 A	4,056,332

CLASS 417

44	4,056,333
189	4,056,334
431	4,056,335

CLASS 418

51	4,056,336
119	4,056,338
131	4,056,337
178	4,056,339

CLASS 423

	4,056,599
239	4,056,600
322	4,056,601
345	4,056,602
359	4,056,603
483	4,056,604
484	4,056,605
575	4,056,606
579	4,056,607

CLASS 424

1	4,056,608
	4,056,609
32	4,056,610
62	4,056,611
76	4,056,612
94	4,056,613
105	4,056,614
120	4,056,615
180	Re.29,465
	4,056,616
200	4,056,617
246	4,056,618
263	4,056,619
270	4,056,620
273 R	4,056,621
	4,056,622
274	4,056,623
	4,056,624
282	4,056,625
285	4,056,626
300	4,056,627
308	4,056,628
327	4,056,629
330	4,056,630
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